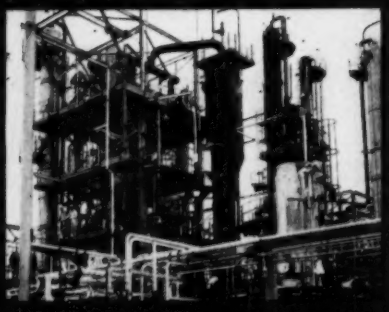
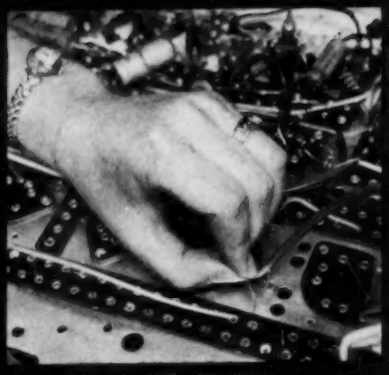
AUGUST
1953

DIGEST





OFFSHORE PROCUREMENT puts money in empty tills, makes arms for NATO, puts people back to work p13

AUSTRALIA'S Menzies—There is uranium in Rum Jungle, and all sorts of minerals in the ground, but he must have help to get them out p15

CANADA is making phenol from cumene. It is the first time it has ever been done and is part of a new era for a gifted country p29

ATOMIC POWER—"The real significance of this new breeding process is that now all uranium is fissionable" p34

TELEVISION chassis has its maze of 1,000 wires fastened at once by solder dip. Secret—a little hollow pin with a hole in the top p38

STUDEBAKER'S Vance heads his company into its second century of success and growth in the U.S. and abroad . . . p49

Two ways to *improve service continuity* at low, long-term cost

Westinghouse Reclosers and Sectionalizers offer two ways to improve service continuity and reduce service calls to a minimum. They assure the *highest degree of service continuity at the lowest, long-term cost.*

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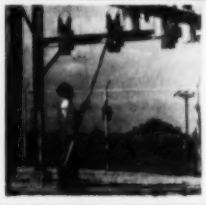

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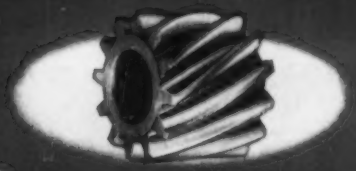
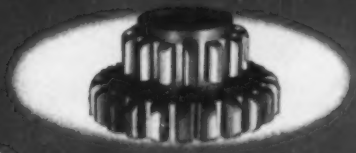
B SHAVING TIME 16 SECONDS

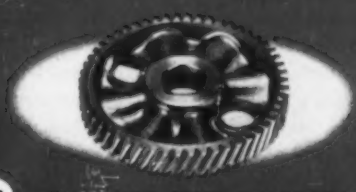
C SHAVING TIME 20 SECONDS



D SHAVING TIME 12 SECONDS



E SHAVING TIME 15 SECONDS



F SHAVING TIME 20 SECONDS

GEAR CHARACTERISTICS

Gear	Stock Removed Over Pins	Material	No. of Teeth	PD	DP	Face Width
A	.010″	Steel	19	2.4″	9.25	⅝″
B	.010″	Steel	29	4.00	9.25	1⅛″
C	.010″	Cast Iron	28	2¾″	10	1¼″
D	.005″	Steel	12	1⅛″	13.5	1″
E	.006″	Steel	14	2¼″	6/8	1¼″
F	.012″	Aluminum	54	5⅜″	10	⅞″

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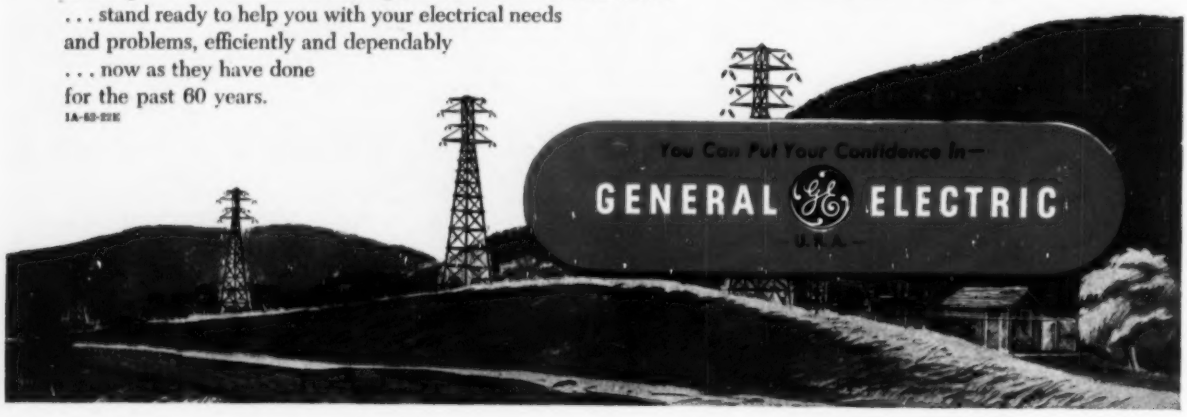

This Month

Dear Reader:

You will find in this month's issue, as in every month, articles covering a wide range of subjects. We hope that they will bring you ideas that you can put to work in your business. And you will find too some general articles of primary interest to management men. Let's look at a few of them.

The lead story is a case study showing how European business interests can share in the Western rearmament program by getting contracts from the U.S. for military equipment. If your plant is in Western Europe, you'll want to look at this story.

Next you'll find an article on Australian development, written for you by our Australian correspondent. This is one of the series you've been seeing every month analyzing the economic and political conditions in various countries.

Their purpose? To give you ideas on where to expand your trade. Write me if you would like to have us continue this series and cover other important trading areas.

If you live in a relatively non-industrialized country that has little or no water-power potential, you may someday push a switch button and have atomic power light your room or run your electric motors. And that day may not be too far off. For U.S. progress and latest thinking, see page 34.

How are your materials-handling costs? If you're worried about them, maybe it's time to consider new ideas, new equipment. On page 14, you'll find a review of the highlights of this year's big materials-handling show. If you want more information on any of these pieces of equipment, or any other kind, we'll be glad to get it for you.

And remember: A good idea at work in your business is like money in the bank; it keeps on paying off.

Sincerely yours,

Harry S. Wharen

Editor

McGRAW-HILL DIGEST

. . . the best from 48 business magazines—see p56

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August 1953 McGRAW-HILL DIGEST Vol. 8—No. 8

Member – Audit Bureau of Circulations

Published monthly by McGraw-Hill International Corporation for circulation in all countries of the world except the United States and Canada. *Publication office:* 99-129 North Broadway, Albany 1, N. Y., U. S. A. *Executive and editorial offices:* 330 West 42nd St., New York 36, N. Y., U. S. A. Curtis W. McGraw, Chairman of the Board; Willard T. Chevalier, President; Eugene P. Warner, Senior Vice-President; Joseph A. Gerardi, Treasurer; John C. Cooke, Secretary; J. C. Stark, Vice-President Publications Division; K. Presbrey Bliss, Vice-President and Director of Advertising; J. E. Blackburn, Jr., Director of Circulation.

Subscriptions may be ordered through Director of Circulation, through local book dealer, or McGraw-Hill Publishing Co. Ltd., McGraw-Hill House, 95 Farringdon St., London, E. C. 4 (British only). Subscription rates: $5 for 1 year, $8 for 2 years, or $10 for 3 years; single copy 50¢ (U. S. currency). Entered as second-class matter January 1, 1953, at the post office at Albany, N. Y., under the Act of March 3, 1879.

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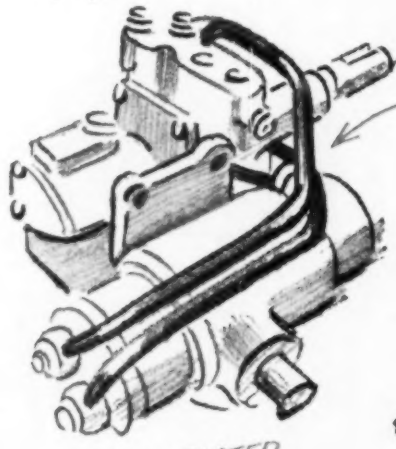

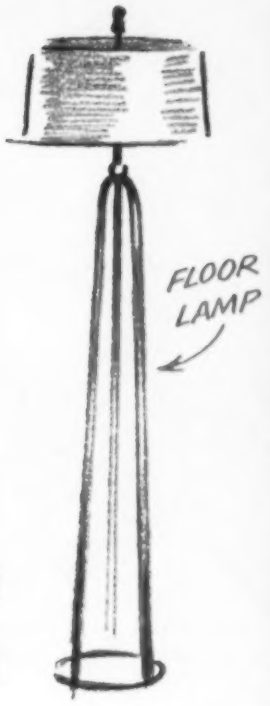

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*Recent unsolicited reports from eight ENTERPRISE power plant installations showed an average of 15,112 BHP hours per gallon of lube oil.

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BUSINESS TRENDS

U. S. PROSPERITY has definitely reached its crest. But businessmen in foreign countries need not be concerned over a severe recession here. Relatively few segments of the economy have weakened. Any business setback, later in the year, will be mild.

Some signs of weakness are appearing. Steel output has slackened to about 98% of capacity, as compared with a record-breaking 101% rate of operation last spring. Still, aggregate steel production for the entire year will reach a new peak of 110-million tons.

Construction of new houses dipped slightly in the second quarter. Scarcity of mortgage money was responsible. But Federal Reserve Board's limited action in easing the tight credit situation has made builders more optimistic. New housing "starts" this year will be 1.2-million—second best ever recorded and 7% above the 1952 figure.

Stock market prices have declined 10%. This reflects expectation of a slight business downturn by 1954. Institutional investors, however, are still buying certain high-quality stocks in quantity. Persistent liquidation of grains and other commodities also depresses the security markets. Future traders are acting cautiously. In addition, money markets are unsettled. The administration long-term money policy is not yet entirely clear. Corporations are reluctant to rush in with new offerings until they are sure of what the administration plans.

Automobile, television and home-appliance output is being trimmed. You can expect further cutbacks in automobile production later in the year, but export of cars from U. S. is up. A few dealers in these consumer durable goods are paring prices to attract customers.

Inventories are still climbing, although at a reduced pace. Annual rate of increase was running at about $2.5-billion. Total inventory backlog for all industry is over $76-billion. Present accumulation of supplies could set off a business slide unless some precautions are taken.

Cost-of-living index has stopped rising. Some prices have fallen, but by now the majority of items have stabilized. Surpluses are evident in several lines. Many sellers must find real concessions to attract buyers.

RETAIL SALES remain well ahead of a year ago. All key cities show a 5 to 10% jump. Heavy retail buying is the backbone of our increased imports. It is responsible for a 3% gain in imported merchandise during the first half of the year.

American consumers will buy more goods in the third quarter of 1953 than in the corresponding period last year. Sales in the first part of summer were unusually strong. Although durable goods account for most of the advance, volume of nondurable goods also is up.

U. S. buyers have been flocking to Western Europe for new items to sell. Fall displays abroad are being shown to the largest audiences since the war. The Spanish market is being combed for saleable goods. Barcelona, especially, is a focal point. Sizeable purchases have been made, but better styling and quality are needed.

French goods are still bought sparingly because of high wholesale costs. A leading fashion for women's clothing is the "Tulip" look from France. Many French handcrafted items are being replaced by articles from Spain.

Buying from promotion-minded German companies is on the rise. West German distributors are now bidding strongly for a larger share of the U. S. market. Italian silks once again are enjoying heavy purchases. Ceramics from Italy have great appeal, both in design and price.

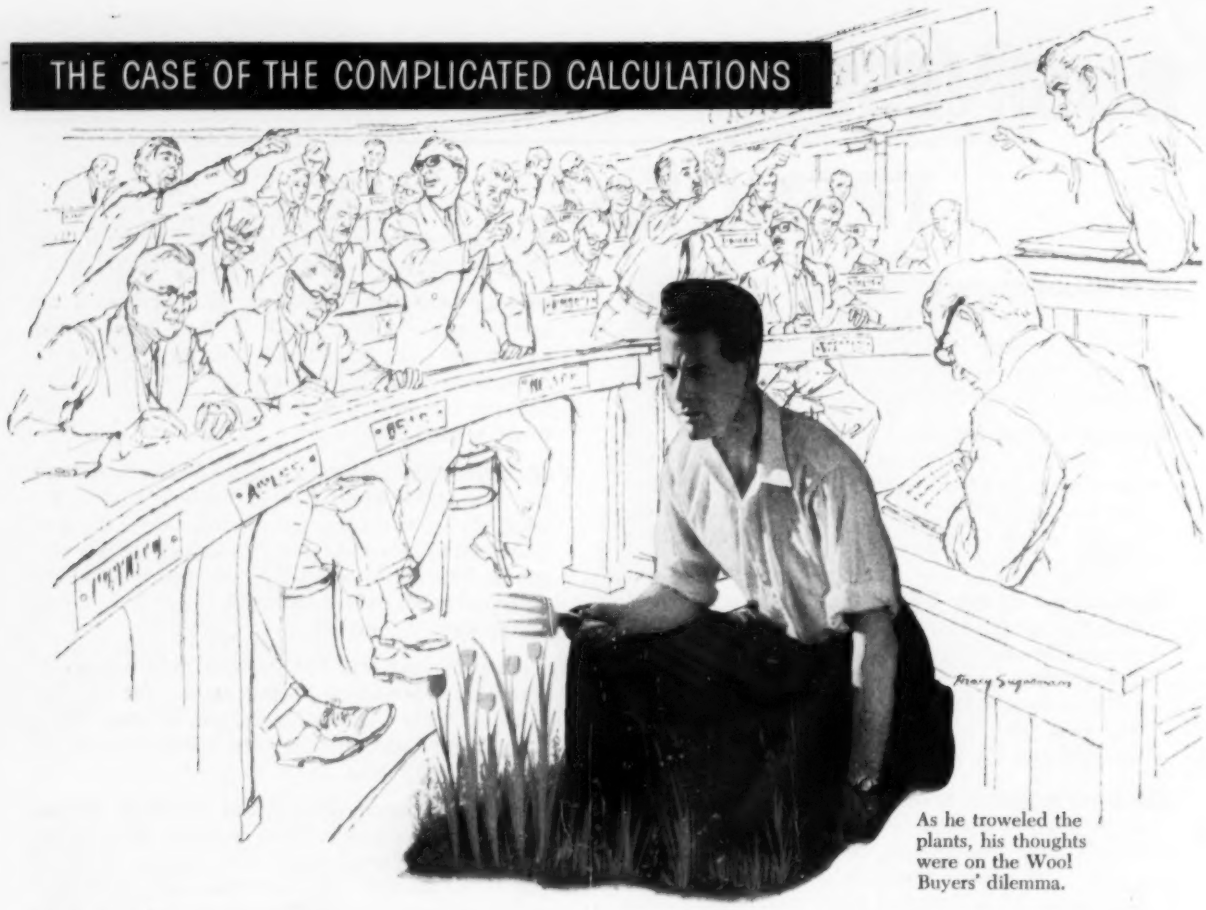
Profits for all U. S. retail firms this year will exceed those in 1952. From now on, the greatest advances will be made in the textile, apparel and soft-goods lines. Here are the major reasons behind the climbing volume:

Physical output is the greatest on record for peacetime. Average Federal Reserve Board Index for the year will probably by 235. This compares with 220 in 1951 and 1952. Heavy production of all kinds of goods provides wide variety of new selections. Spending is thus encouraged. And consumers are spending because they are better off financially. Incomes have jumped 38% in the past year. Personal earnings after taxes will reach a new peak in 1953.

Savings are at an all-time high. And short-term debt is low in relation to savings and income. The over-all cost of living will be down slightly for the year. Most buyers offer a minimum of resistance to prices.

U. S. markets are growing. Population, wealth, and spending are increasing in every section of the country. More people over 65 mean more drug, plain-food and leisure-type clothing sales, but less demand for household durables once present needs are met.

THE CASE OF THE COMPLICATED CALCULATIONS



As he troweled the plants, his thoughts were on the Wool Buyers' dilemma.

Solution discovered—in a salesman's garden!

Henri Wattinne S.A.R.L., Wool Buyers of Wellington, N. Z., were desperate!

At wool auctions the Buyers had to have detailed "Bareme" tables to guide bidding—give them the proper balance between greasy wool prices at home and clean wool prices in England.

Preparation of these tables was a clerical nightmare! A single table might require 10,000 carefully checked calculations. Separate tables were needed for each client, often on short notice. Price fluctuations quickly outdated them.

Wattinne called the Burroughs man . . . asked for a system or machine that could speed the work. The Burroughs man quickly analyzed the case, but could find no ready answer.

A fortnight later, while working in his garden, the solution came to him. Some slight changes in the current Burroughs Desk Model Balance Scheduling Machine would, he believed, turn the trick. The plan was approved by the factory . . . the machine arrived air-freight in time for next season's work.

Result? Wattinne's found that the new Burroughs could calculate, run-off, print and check five pages of calculations *in one hour!* And buyers no longer have to add adjustment figures . . . the machine prepares complete tables at the shortest possible notice.

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To better *your* business, call the Burroughs man today! There are Sales and Service Offices in major cities around the world. Burroughs Adding Machine Company, Detroit 32, Michigan, U.S.A.

FOR EXPERT ADVICE IN ANY FIELD OF BUSINESS FIGURES . . .

Mr. F. C. OXLEY of Henri Wattinne S.A.R.L., Wool Buyers, Wellington, N. Z., watches his new Burroughs Desk Model Balance Scheduling Machine in operation. With him, left, is Mervyn Drake, the Burroughs man who helped solve the Case of the Complicated Calculations.

CALL THE Burroughs MAN

WASHINGTON REPORT

REORGANIZATION of the U. S. foreign-aid setup now underway will mean more efficiency, more flexibility, less duplication for future aid programs. Mutual Security Agency and Technical Cooperation Administration (Point Four) will be merged into a new Foreign Operations Administration (FOA).

This merger will mean tighter integration of aid programs. It will do away with the arbitrary distinction between TCA technical assistance and economic aid. Washington will be able to fit its techniques of aiding each country more flexibly to its individual needs.

Regional headquarters of the MSA in Europe will have less authority. It will have authority only to represent the U. S. in dealings with regional groups like the North Atlantic Treaty Organization and the Schuman Plan.

This reorganization will remove one whole link from the chain of command tieing Washington to foreign-aid programs. No longer will there be one headquarters in Washington and another duplicating it in Europe. MSA mission chiefs in each country will be the economic counselors of the embassies.

But regional planning of aid programs by major areas will be pushed harder in Washington. The regional approach has worked better in practice than the uncoordinated country-by-country method of planning.

You will see little change in the relationship between the new FOA and State Department from the old MSA-State relationship. The Secretary of State has been given clear authority for setting basic policy for the new agency. But in practice the new agency is bound to influence policy by the way it spends its money.

U. S. IMPORTS of goods and services will stay up for the rest of the year, according to government trade analysts. Merchandise imports will dip some. Inventories of copper, lead, zinc, newsprint, and cocoa are high, so buying will slacken off in the second half of the year. Imports of nickel, cobalt, tungsten, and aluminum probably will rise slightly as new sources of supply come in.

But military expenditures abroad for troop pay, bases, offshore procurement—which are classified as imports—and for tourism will rise enough to take up any slack that may occur in the merchandise account.

Big question mark for next year is whether there will be a dip in U. S. business activity, how deep it will be, how long it will last. Any downturn would hit imports hard. A sharp drop would hurt foreign dollar reserves. An encouraging feature of the current strengthening of foreign dollar reserves is that it is not the product of a world boom and skyrocketing raw-materials prices the way it was in 1950. Therefore, chances are better for a lasting improvement in the free-world dollar trade balance.

WEAKENING of De Gasperi's Center regime in the Italian elections was a blow to U. S. European policy. It further dims chances of ratifying the European Defense Community and promises increased political unstability in Italy.

But Washington sees two hopeful factors in the election returns:

- De Gasperi's Christian Democrats picked up strength compared with the last elections. It was the other Center coalition parties that lost. The reversal of the recent trend of dwindling Christian Democrat strength may point toward a strengthened Center in the next elections.
- Communist gains, heaviest in the south, clearly reflected economic misery. The big land reform program in the south is just getting underway. It should wean votes back from the Communists by the next election.

So Washington is not yet ready to write off its policy of economic aid to Italy as a failure.

THE ADMINISTRATION'S "Buy American" Policy has been clarified. The Defense Department's award of contracts to British firms for heavy electrical equipment for the chief Joseph and McNary dams means that the new administration will not return to a strict enforcement of the 25% preferential price margin given to U. S. firms.

But foreign suppliers of the U. S. Government are not yet completely reassured. They are watching to see whether the procedure followed in the Chief Joseph bidding will be repeated. English Electric Co. originally was low bidder on both transformers and generators for the project. The Defense Department threw out the first bids. Westinghouse was low bidder on the generators—biggest slice of the contract—in the second round of bidding.

This procedure of calling for new bids also was used on bidding in Chicago for an Army contract for kitchen equipment. If it became a pattern, it could make it even harder than before for foreign firms to sell to the U. S. Government.

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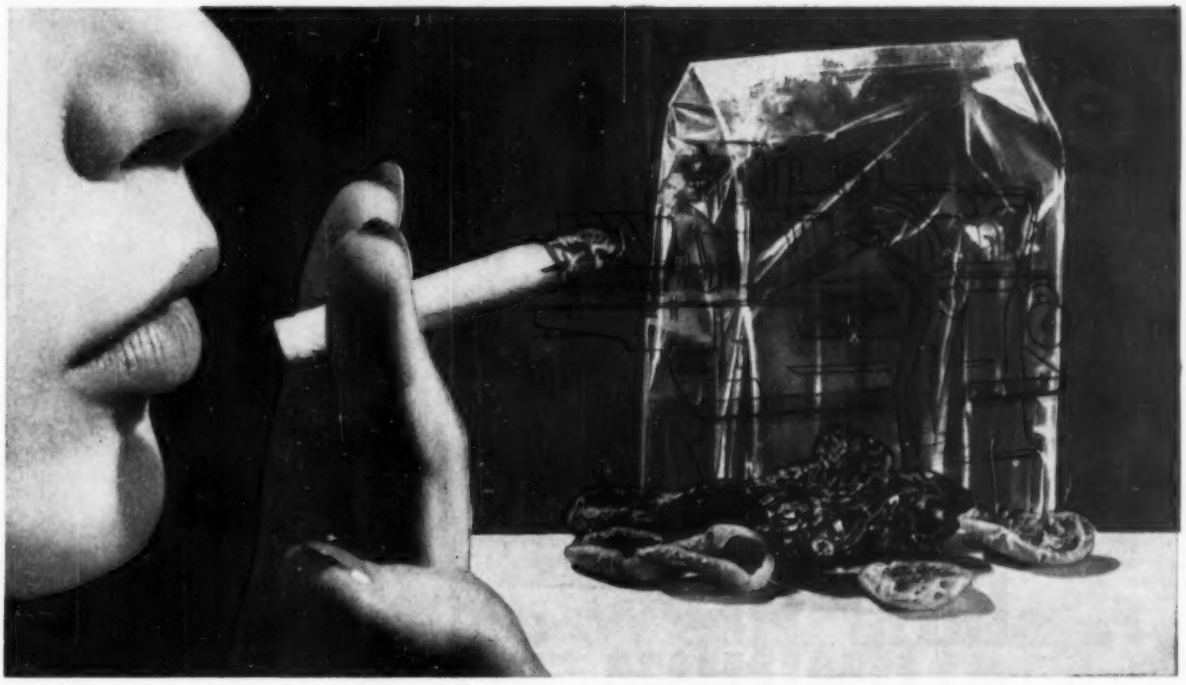

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AUGUST 1953
VOLUME 8 • NUMBER 8

McGRAW-HILL
DIGEST

ITALY'S Microlambda, guided by Raytheon's president and director of research, makes radar equipment

BRITAIN'S Royal Ordnance Works has over $100-million in offshore procurement contracts for its Centurion

U. S. Buying Arms Abroad . . .

Helps Build Up West Europe

Western Europe gets an economic lift through "offshore procurement." Arms industry gets a boost; people get jobs; Europe gets dollars; NATO gets arms

OFFSHORE PROCUREMENT really got rolling a few weeks ago when an Italian company, Microlambda, delivered the first units on a $20-million contract to supply the North Atlantic Treaty Organization forces and when Turkey got its first offshore procurement contract.

Under offshore procurement the U. S. buys military equipment—arms, munitions, planes, tanks—from one Western European government, then gives it to either the producing country or another nation under NATO.

About three months ago NATO awarded $550-million of orders for planes to European manufacturers. The U. S. is pledged to pay for about 50% of these contracts. Most of the U. S. contracts under this program have been awarded. Aircraft companies in England, France, and Italy will turn out planes for NATO.

The U. S. Defense Dept. figures it accomplishes three things at once by awarding such contracts:

- **It gives** NATO forces the arms that the U. S. has agreed to supply.
- **It builds** up arms industries in Europe, while cutting down on the drain on U. S. industry.
- **It bolsters** Western Europe's dollar reserves.

The U. S. has spread offshore procurement all around Europe. And recently the smaller countries have been getting more and more contracts.

Italy's partly public, partly private electronics company, Microlambda, is a good example of how offshore procurement works, from both the U. S. and the European viewpoint. Microlambda not only has better than $20-million of contracts under offshore procurement, but offshore procurement is the reason for its very existence.

In August 1951 when offshore procurement was first authorized, U.S. Defense Dept. decided that electronic equipment should be included in the program. As part of its effort in this direction, Defense went to Raytheon Mfg. Co., of Waltham, Mass., for help in setting up or finding a West European electronics plant that could turn out radar

equipment to meet U. S. standards.

Raytheon began by talking to people from Finmeccanica—an Italian group (partly private, partly public) that was set up after the war to rebuild Italian industry. As a result of the talks, Finmeccanica set up Microlambda as a subsidiary with a capital of 500-million lira ($800,000). And it immediately began to send engineers and technicians to the U. S. to learn about modern electronics at Raytheon.

Next step was the signing of an $11-million, three-way contract (another $9-million was added later) between Microlambda, Raytheon, and the U. S. Navy in July 1952. As its part of the agreement, Raytheon licensed Microlambda to build an early warning radar device.

Raytheon agreed to give the Italian company its drawings, to help train engineers and technicians, and to supervise the construction of a plant. And it agreed also to guarantee the sets.

To do this, Raytheon keeps resident inspectors in Italy, as does the U. S. Navy. While Italian engineers and technicians were studying at Raytheon, several Raytheon men went to Italy to supervise the building of an up-to-date plant.

Under Raytheon and Navy supervision, Microlambda built a modern plant at Fusaro, a suburb of Naples. It is at the site of a bombed-out torpedo factory. The location had one big advantage. There were a number of skilled workers still in the neighborhood.

Many of these ex-torpedo makers either were out of work or were working as unskilled labor. Now a lot of them are among the 400 workers who are employed at the new electronics plant. And they are getting good wages, by Italian standards.

It is not only at Fusaro that people are getting jobs because of Microlambda's offshore contract. Microlambda has some 17 subcontractors supplying it with parts, including one in West Germany and one in Switzerland.

From the U. S. point of view, its dealings with Microlambda have accomplished just what offshore procurement is supposed to accomplish. Italy is getting dollars and has a new industry; NATO forces can now get some of their U. S.-style radar equipment right on the Continent instead of having to depend on a U. S.-Europe supply line. —Business Wk, May 16, p154

Three-Dimensional Television Lens

This is how the world looks through wide-angle lens with a 142-deg. field of view. It is being used at the U. S. Navy Special Devices Center, Sands Point, N. Y., in a gunnery trainer. A television system using this wide-angle lens and a special receiver to provide three-dimensional TV are under development by Radio Corp. of America.—Electronics, June, p14

Materials Handling

. . . as a time and money saver keynoted the National Materials Handling Exposition this year

THE ANNUAL materials-handling show held in Philadelphia played to an audience of 35,000 visitors looking at, and buying, the products of 340 manufacturers. Here are a few highlights of the show:

• **Experimental** X-70 lift truck, shown by Clark Equipment Co., has load and moment gages, overload warning signal, synchronized loading lights, automatic seat adjustment, two-way radio. Clark also showed two clutchless drives—Hydratork (hydraulic drive) and Dynatork (electromagnetic drive).

• **Anti-skid device** was introduced by Yale & Towne Mfg. Co. on its fork trucks. It is a brake that stops a spinning drive wheel, forcing a tractive wheel to move the truck in mud or snow.

• **Power steering,** exhibited by Towmotor Corp., needs only 6-lb. effort for a full turn.

• **Straddle truck,** shown by Hyster Co., is rated at 30,000 lb. for handling stock in yards.

• **Spur, or Y-switch,** was exhibited by Rapids-Standard Co. for connecting a belt conveyor to either of two wheel conveyor lines at different levels. Automatic stops operate on the unused spur to stop goods until the switch is reset.

• **Traffic-cop switch,** shown by Standard Conveyor Co., feeds two adjoining roller conveyors into a single line without allowing parts to bunch.

• **Magnetic** assembly conveyor table, introduced by George Koch Sons, is made of stainless steel with a magnetic belt passing under the work area. Magnetic work carriers follow the magnetic line.

• **Stacker crane,** shown by Whiting Corp., operates from crane rails and supports work on fork carried by a pendant mast. Push-button controls operate fork in three directions. The mast rotates 360° for stacking in narrow aisles. —Am Mach, June 8, p194

Snowy River at Jindabyne is the site picked for a dam that will cover this countryside with water as one part of the Snowy Mountain hydroelectric scheme.—An original Digest article on . . .

Australian Development

MELBOURNE—At least $1-billion will be spent within the next few years on the development of Australia's huge, untapped resources. As a large proportion of this staggering sum will come from abroad, foreign countries are showing more and more interest in the state of Australian economy. On an average, two serious inquiries about investment in Australia are received daily by Australian federal and state authorities.

Australia needs foreign investment. Taking into account the small population and the relatively limited capital at its disposal, the country Down Under has done pretty well in the past. But it needs foreign help even to estimate its own mineral resources.

Recently, Australia discovered uranium in huge quantities and grouped in at least two distinct uranium fields. Experts believe that one of them, the Rum Jungle Uranium Field in the Northern Territory, may yet prove to be the world's richest concentration of uranium ore.

New findings of lead, zinc, tungsten, and bauxite have been announced. The discovery of bauxite means that some day a strong aluminum industry will be based on domestic materials.

Important to the Australian economy too will be the growing importance of titanium. Australia has the world's largest, and truly enormous, resources of rutile, the beach sand from which titanium is made. Australia also has gold and silver, and enough copper to begin exporting it; first shipments are going to the U. S.

The only critical material that Australia lacks is domestic petroleum. But experts are hopeful of finding oil in Australia. Even now, U. S. capital, combined with local capital, is increasing exploration efforts.

The big problem in Australian development is a compromise between the emphasis on food and raw-materials production and the recent trend to increase Australian manufacturing activities.

Britain would like to see Australia concentrating on its traditional exports of foodstuffs, wheat, and minerals. But the fast-growing Australian secondary industry points to its undoubted successes and to the employment it provides for most of the Australian population.

Undue emphasis on food production, Australian experts claim, would mean large pockets of unemployment, Australian industry is well mechanized, and establishing, say, 1,000 new farms annually would cost about $25-million and provide employment for only 3,000 persons.

The Australian manufacturing industry, supported by strong foreign interest, is a vital, growing part of its economy. In the production of agricultural machinery and implements, Australia ranks as the third largest in the world. It has made the world's most powerful bulldozer, and only the U. S. manufactures more earthmoving equipment. Manufacturing techniques are based mostly on American experience, and Australian technical know-how is progressing rapidly.

All these achievements, good as

The Future

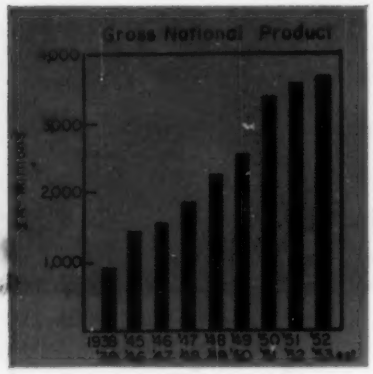
A statement of policy on Australia's welcome to foreign investment comes from W. H. Spooner, Minister for National Development.

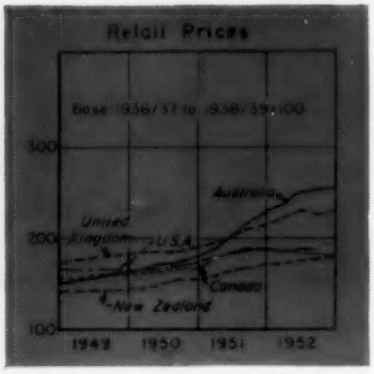
"Australian development is today attracting more participation by overseas interests than ever before. In the manufacturing field, where the heaviest concentration of our development is taking place, not only is the extent of overseas investment at record levels, but its proportion to the total is also greater than ever before.

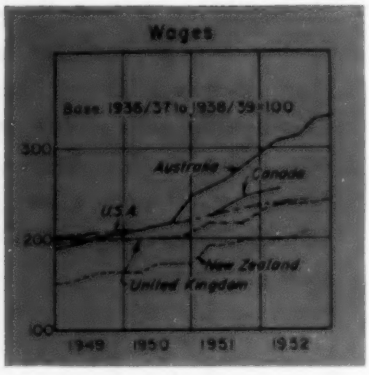
"At present, Australia's programme of industrial expansion involves new investments totalling nearly £A230,000 and of this about £A142,000 comes from companies in which overseas concerns have control or an important interest.

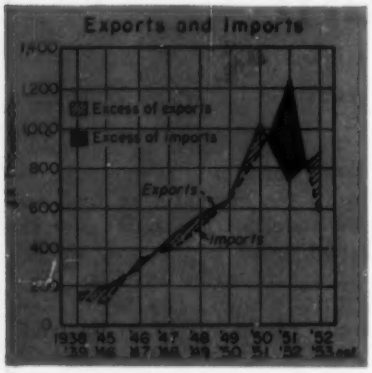
"Australia's policy is to aid and foster this type of overseas partnership in her future. Particularly do we encourage new techniques, new products, and new capacity to help meet our growing needs."

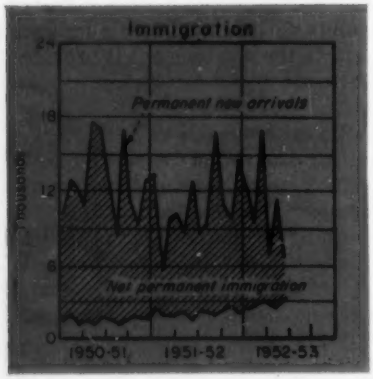
"The country, at present, is highly prosperous"

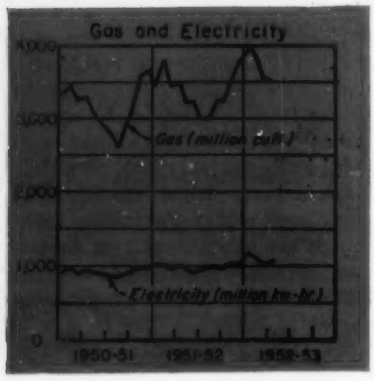












they are, still remain inadequate. To survive, Australia needs large-scale immigration, and that can be made possible only with increased investment, either from abroad or within Australia.

The country, at present, is highly prosperous. Recent incomes of Australian farmers were estimated to be 16 times greater than in the immediate prewar period. The national income is incessantly swinging upward; latest estimates show an expected national income of over $9-billion in 1953–1954.

Where is Australia going to develop? Well advanced plans have been formulated for an all-out development offensive. Heading it will be the huge engineering projects.

Among them is the Snowy Mountains hydroelectric scheme, broadly based on America's Tennessee Valley Authority and scheduled to become one of the world's biggest of its kind. It is already under construction and close to $120-million has been authorized to continue the work. Total cost of the completed project will be well over $500-million. It will boost Australia's power production by 3-million kw.-hr. and provide 2-million acre-ft. of water to irrigate some of Australia's most fertile areas. The large increase in power production will multiply the present industrial consumption of 2.5 kw.-hr. per factory hand. Helping too will be many more minor projects, on which annual expenditure will be close to $300-million.

The petroleum industry is planning a great expansion in Australia. Annual refining capacity is being increased by the installation of several new plants; by 1956 the capacity of refining plants will reach 7-million tons a year.

Anglo-Iranian Oil Co. is spending close to $100-million on its new refinery in Western Australia. California Texas Oil Co. is spending $60-million, and Standard-Vacuum Oil Co. $35-million on their respective refineries. Shell Oil Co. is spending about $20-million.

This expansion will lead not only to a self-sufficiency in most petroleum products, but also to an active expansion in the chemical industry. Many millions will be invested in that industry with the British Imperial Chemical Industries and a subsidiary of Monsanto Chemical Co. leading the field, which includes several other foreign and wholly-Australian companies. Australia, however, will still lack aviation gasoline because its development in aviation has outpaced its size and population.

Many other industries are scheduled for large-scale development. Food processing is attracting more attention and capital, with Heinz Co. and some American milk companies interested in further development in addition to their already substantial manufacturing interests operating in Australia.

Australian steel (the world's cheapest) will be produced in greater quantities, and there will

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"Foreign investors are uneasy about . . . socialism as a panacea"

be more Australian-made aircraft. The great success of General Motors Corp. with its first Australian-made automobile, the popular Holden, has encouraged other U. S. companies. While 25,000 Holdens are being built every year and export demand may force an expansion, both Ford and Chrysler interests are expanding their Australian production facilities for automobiles and trucks.

To attract needed foreign capital, double-taxation treaties are being concluded with the U. S. and Canada. The free-enterprise government of Prime Minister R. G. Menzies has arranged for several dollar loans from the World Bank and is studying means to attract Swiss capital and to reverse the trend of decreasing British capital investment in Australia.

British companies are somewhat reluctant to invest heavily in Australia. But import restrictions and foreign competition have forced them to pay more attention to the needs of the Australian market.

Australia, mindful of its balance of payments problems, is also developing local production of products that previously have been wholly imported. Cotton, tobacco, and linseed are typical examples with large projects under discussion.

In neighboring New Guinea and other Pacific Islands under Australian rule, an expansion is being planned for the growing of kenaf and the introduction of such new commodities as tea and coffee. The cultivation of rice also will be expanded in response to the demand from South Asian countries whom Australia is helping through its participation in the British Commonwealth Colombo Plan.

Australia's biggest problem at present is high domestic costs and wages—especially the high wages. These, the result of a somewhat unique experiment with overfull employment, are causing great concern to Australians who note that the index of imported goods dropped 16% in 1952.

Prices of imported raw materials also dropped, by one-third, but the problem is slowly and steadily becoming an acute one. Higher tariffs and more import restrictions are not expected to solve the fundamental problem.

The "traditional" exports are flourishing again after some recession. In spite of synthetic fibers, wool is still selling well. But Australian growers are keeping their eyes closed to the danger that the new fibers hold for the wool industry.

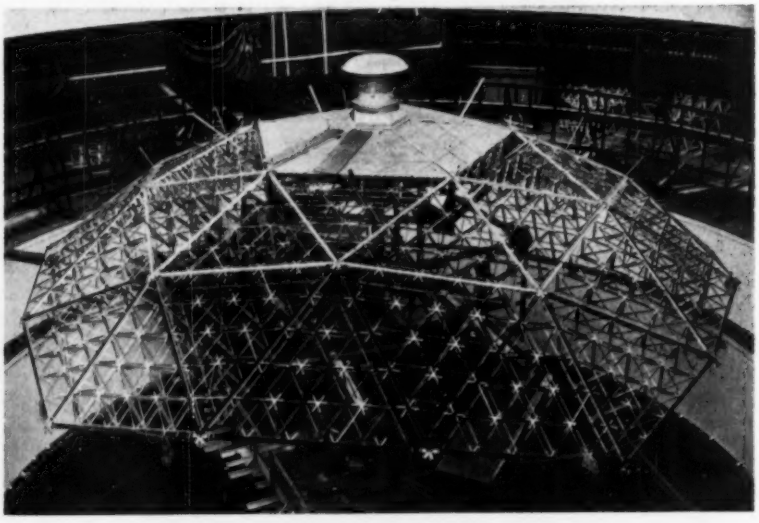
An expansion of production in foodstuffs is being planned, but fertilizer costs are relatively high and farmers are most conservative when it comes to trying new methods and new equipment. The fact that many of them still remember the worst depression days and the glut of products hinders the government in its educational drive for more food production.

Large-scale improvements are still needed in the Australian transportation system and in the development of communications. Needless to say, the intended introduction of television will also mean an increased manufacturing and distribution activity.

Australia hopes that her special measures to attract foreign investment will prove successful. She also hopes, and presses hard for it, to see full sterling convertibility in the not-too-far future.

Menzies' government has gone through a minor recession period; although it has gone a long way toward curbing inflation, its recovery measures, nevertheless, have been quite unpopular. Socialists have gained in popularity and foreign investors are uneasy about investing in a country that may turn one day to socialism as a panacea for its troubles.

But even Australian labor is devoted to the idea of great development in Australia. Down Under, it is not a question of partisan politics because nearly everyone now recognizes that failure to develop Australia well, and to develop her quickly, may mean a failure of the Western civilization, the end of a white Australia, and, through the inability to help its Asian neighbors, the failure of the West in one stage of its fight against communism.



Lightweight Dome Covers Court

Ford Motor Co. wanted a dome to cover the inner court of its circular Ford Rotunda. It had to be light to minimize load on the existing structure. A hemispherical 93-ft.-dia., trussed dome, made of more than 21,000 light-gage aluminum members, met requirements. Total weight is 8.5 tons. First, struts in groups of three were fastened together to form triangles. Next, three triangles were joined together with three struts to produce an octahedron. In turn, ten octahedrons were connected together to make a three-dimensional truss. Finally, 160 trusses were bolted together to form the dome.—Eng News-Rec, May 28, p31

New Grinding Techniques Seen For the Near Future

When the Norton Co. opened its new plant for its grinding-machine division (McG-H Digest, July, p17), the company's director of research and engineering had this to say about the next 5 or 10 years in grinding developments:

• **Electrolytic-assisted grinding** —An electric current is passed through an electrolyte used in place of a standard cutting fluid. That speeds metal removal. An automobile maker is production-testing it.

• **Automatic-indexing, multi-slide wheel grinders** — Several wheels move in at once to remove metal from more than one surface of a piece. As they withdraw, the piece is indexed to a subsequent station for more multiple grinds.

• **Automated grinders** — Some day, soon, complicated grinding operations will be automated to the point where they become integral parts of a coordinated, automatic production line.

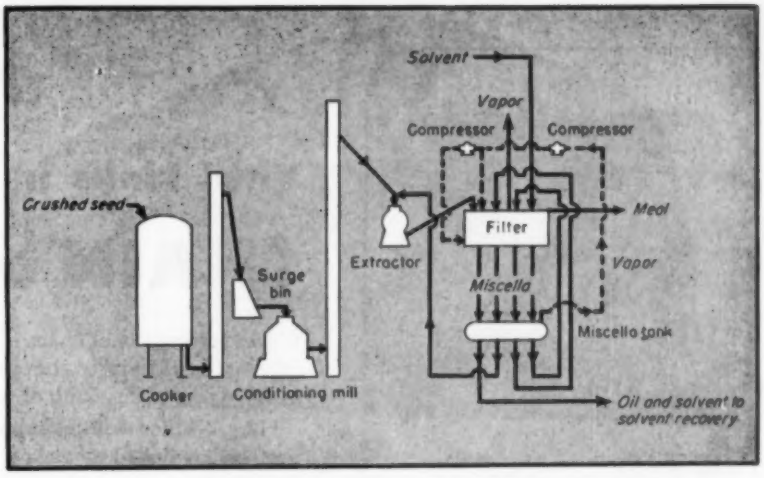
• **Constant - peripheral - speed grinders**—Controls will vary rotational speed by the exact amount necessary to compensate for wheel wear and the diminishing dimension of the work piece.

• **Air-blast and water-blast grinding**—A high-pressure stream of air, water, or aerated water will "grind" minute amounts of metal. It is under development as a possible technique for finish grinding where ultra-fine tolerances are needed.—Factory, June, p130

Process Removes Sulfur

New desulfurization process for use on light and middle distillates has been announced by Royal-Dutch-Shell Laboratories of Amsterdam, Holland. Called Hydrodesulfurization, the process employs a trickle technique to treat liquid feedstocks. The feedstock is trickled in a thin film over a bed of solid catalyst. Recycled hydrogen constitutes the continuous vapor phase.

The process, which converts sulfur compounds to hydrogen sulfide, needs an outside hydrogen source. So it is considered economic when operated in conjunction with catalytic reforming, which produces net hydrogen in the tail gas. —Oil & Gas J, June 8, p92



Better Solvent Extraction Process

Filtration-extraction process, developed by U. S. Dept. of Agriculture (McG-H Digest, June '52, p56) for extracting oil from cottonseed, looks promising for other uses—soybeans, peanuts, and rice bran. And it may be advantageously applied to many chemical and food processes. Oil is put into solution in a slurry mixing tank; then concentrated miscella is separated from meal in a filter by countercurrent displacement washing. Weaker miscellas and hexane wash the meal. A 100-ton-a-day plant costs $1-million. Licensees include Vern E. Alden Co., Blaw-Knox Co., Lukens Steel Co., Day & Zimmerman, Wurster & Sanger. —Chem Eng, May, p124.

New Zealand Makes Its Own Atomic Plans

New Zealand is likely to become the first country in the world to apply geothermal steam to the production of heavy water, and also the first country to harness geothermal steam for the dual purposes of making heavy water and electricity.

Geothermal steam trapped far below the surface of the earth will be used to produce heavy water for use as a moderator in atomic piles. It would be exported from New Zealand to the United Kingdom, United States, and Australia. Research on the best process method is now underway.

The country does not intend to produce atomic power itself, but New Zealand scientists have expressed a desire to start an atomic pile with help from Australia. According to some estimates, this pile might be in operation as early as 1960.—Power, June, p266

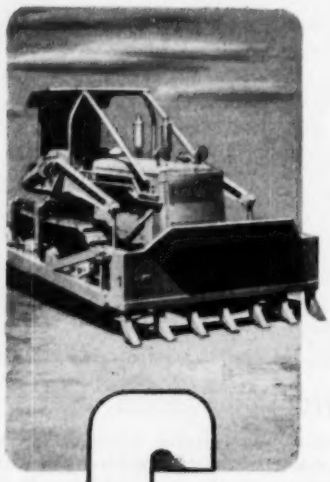
Concrete for Pit Poured From Top to Bottom

At the new tin-plate mill recently completed at Kaiser Steel Corp.'s Fontana plant, engineers faced a problem in constructing a 70-ft. deep "looping" pit. But the construction superintendent solved it with a comparatively low-cost method.

The problem was what method should be used in making the pit excavation and pouring the concrete. It was finally decided to do the job by making seven sectional concrete pours, working from the top down.

On the first excavation, the upper portion was sloped out to form a natural concrete wedge. A shiplap soffit was placed at the bottom and inside forms were built. Wedge-shaped blockouts were built on the soffit to provide pour pockets for the next section below.

Forms were removed as soon as the concrete was strong enough to permit excavation of the next step. On each lift, the soffit was again placed.—Const Meth & Equip, June, p170



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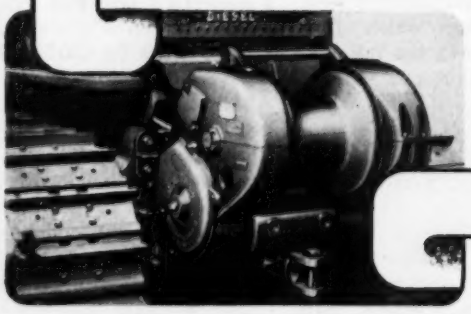

Shown are some of the outstanding allied equipment lines: Pullman-Standard Klearing-Blade with TD-18A tractor, Drott Skid-Shovel and TD-9 tractor, Carco Winch on TD-18A tractor, Bucyrus-Erie Bullgrader with TD-24 tractor, Hough Payloader.

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This Month's How To . . .

. . . make sales with 3-D

To show potential customers what good lighting will do for their plants, showrooms or offices, both Boston Edison Co. and Sylvania Electric Products Co., are using color stereo slides. The slides plug an important gap in these companies' sales campaign by showing customers before-and-after pictures of jobs where better illumination has markedly improved conditions.

One big advantage of the slide method is its ability to show another important factor in good lighting — the proper use of color in floor, furnishings and walls. Knowing that satisfied customers are a good source for increased sales, these companies also show buyers before-and-after pictures of their own installations so they can actually see what they bought.—Elec World, May 25, p34

. . . simplify inspection

Standard Pressed Steel Co. checks quality of sample lots with lot-plot boards instead of paper forms. Boards save time, are more convenient.

The lot-plot board has tolerance dimensions indicated on a scale along its left side. The operator, checking small screws, measures a screw on "tri-roll" gage, then puts it in a hole in the board opposite its exact dimension on the scale. Quality aim is a normal frequency distribution around the mean, with extremes at least two points within tolerance limits.—Factory, June, p113

. . . join a growth industry

The easy answer is to make something people want. The specific answer—for chemical manufacturers—is to make a nonionic (alkyl aryl polyoxethylene, sulfated derivates, etc.). Market forecast is a 60% growth in the next 2 years.

Big users will be superphosphate manufacturers as nonionics softens it, makes it easier to handle, speeds wetting and penetration. Other uses are for wool scouring, metal cleaning, commercial-laundry soaps, automatic-dishwasher and washing-machine detergents, emsulsifying waxes and resins for paper and textile finishes, wetting down dust and inhibiting corrosion in mines and foundries.—Chem Wk, May 30, p52

Your next Flight

THE NEXT TIME you travel, treat yourself to a new experience in comfort, attentive service and schedule reliability: fly PAL. You will understand, then, why many experienced travelers choose PAL whenever their itinerary permits. There is a spirit — an atmosphere — of quiet competence and warm hospitality that will make every minute of your journey a pleasant experience.

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New Oil-Well Equipment

. . . captured the attention of the thousands of visitors at the recent ten-day International Petroleum Exposition held in Tulsa, Oklahoma

THE LARGEST OIL SHOW ever held by IPE showed oil men how to increase the efficiency of their operations. Here are some pioneering ideas in equipment:

• **Drilling**—Trends in drilling equipment include refinements in portability and mobility to reduce rigging time and effort, more strength and power for faster and deeper drilling, and improved drilling controls and rig instruments.

One manufacturer exhibited a 94-ft. trailer-mounted cantilever mast that consists of only two sections, the top section being retractable into the bottom. It has a racking-platform fingering capacity of 5,760 ft. of 4½-in. drill pipe. Another innovation shown was an integrated, self-propelled derrick and rig.

• **Production**—What is believed to be the world's first fully automatic paraffin scraper for flowing wells was demonstrated. The tool, inserted in a well, sinks to the bottom where the higher temperature expands an alcohol-containing bellows. Flowing pressure then forces the scraper upward along the tubing walls.

Among the many pumps shown was one that has a liquid-cooled engine designed to run a year without servicing. A special water return eliminates the water pump. Fan-shaped segments on the flywheel take air in at the sides and direct it radially at high speeds.

• **Processing**—New pump and compressor designs gained attention. One new refinery pump handles extreme ranges of temperature, pressure, and volatility. It can pump volatile liquids at temperatures close to their flash points. Capacities range up to 13,000 gal. per min. for heads to 600 ft. and temperatures to 800° C.

A small sealless, leakproof centrifugal pump in capacities to 150 gal. per min. was shown. It is especially recommended for handling corrosive, radioactive, or highly volatile liquids; for processes under vacuum; or for liquids that must be kept from contamination with air in oil.

• **Instrumentation**—Shown for the first time was a new electronic control system based on a modified Kelvin bridge principle. The system, suitable for refinery or gasoline plant, has no lag in the transmission system, can be mounted away from the process area, and can be tied in with pneumatic systems.

Remote control of liquid level in storage tanks is possible with electronic equipment demonstrated. It senses liquid level by measuring voltage output with tank transmitter units employing two precision potentiometers located at the tanks.

• **Pipe Lines**—One manufacturer showed a full-size pilot-model ditcher from which the tractor can be detached in less than ½ hr. to permit its use for other operations. It operates at speeds from 4 in. per min. to as high as the material being worked allows. The ditcher part of the unit digs a trench 20 in. wide and is no wider than the tractor.

Clearing rights-of-way should be easier with a new versatile machine. A 15-ton unit mounted on a crawler-tractor, it can clear brush and trees up to 6 in. in dia. in a swath 6 ft. wide. It does this by rapidly rotating a steel drum to which are attached 20-lb. steel "flails".

• **Exploration**—Among the new equipment shown to make it easier to find oil was a portable seismograph of 48-trace application. No one piece weighs more than 50 lb.

Another new instrument exhibited was a dip-logging tool. It determines the dip of subsurface formations for the purpose of locating wells higher on the structure and pointing out the direction to develop oil-bearing reservoirs.—Oil & Gas J, May 25, p127

Cleaning by Air Streams Minimizes Fiber Damage

Cleaning by air minimizes fiber damage and insures a high degree of trash removal. Lummus Cotton Gin Co. backs this statement up with experience with its Super Jet cleaners.

The air cleaners work this way: two streams of air intersect—one high-velocity stream carrying the mixed lint and trash, the other going fast enough to change the direction of the lint only to the resultant direction of the two streams. Particles of greater mass than the lint continue in the direction of the high-velocity stream.

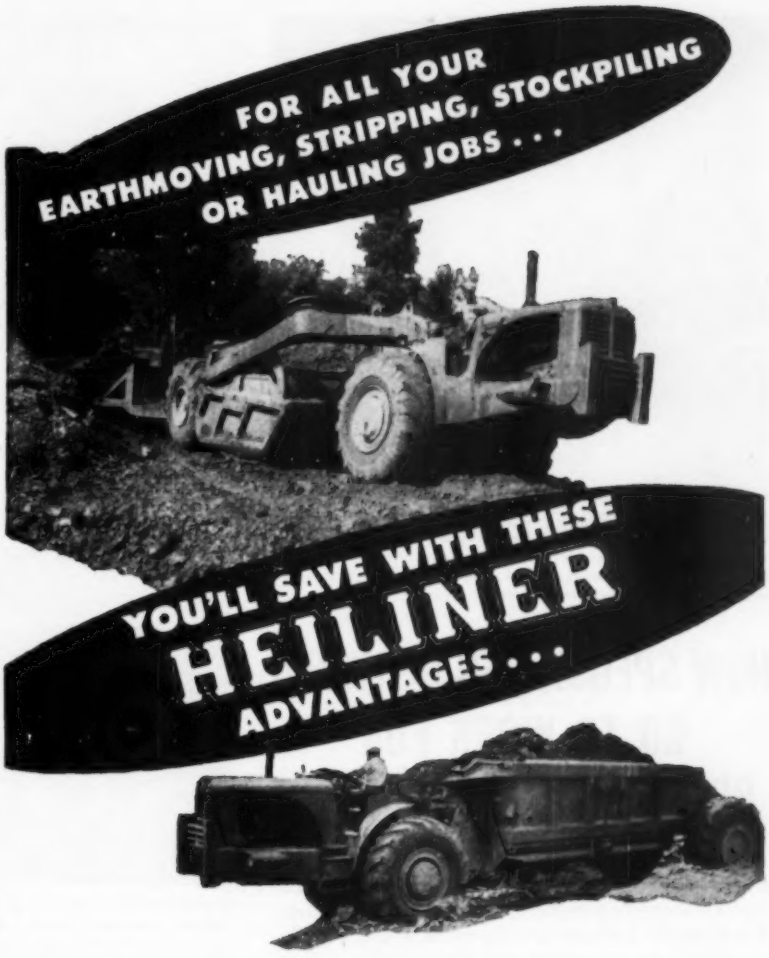
Because a Super Jet has the ability to remove large pieces of leaf, grass, and stems, the unit should come early in the cleaning line. The efficiency of any cleaner is greatly reduced where foreign matter is broken and entangled with fibers. The opener and cleaner should be installed right after the blending and mixing feeders. At this point the cleaner has a good chance to remove nep stock.

If nep count or fiber damage is plotted against mechanical handling in cleaning, the curve will show a gradual increase up to a certain point, then break sharply upward. This "breaking point" varies greatly with the fiber properties of the lint. Every effort should be made at the gin and in the mill to finish the cleaning process before the break in the curve is reached.—Textile World, May, p133

Extends Frankfurt Life

Shelf life of frankfurters can be extended when they are stored in an atmosphere containing appreciable quantities of carbon dioxide. The CO_2 controls microbes that cause rapid deterioration.

Molds, micrococci, and yeasts are completely controlled at 50% CO_2 concentration. Growth of lactobacilli, on the other hand, is not affected by it. Greening did not occur in recent test run on samples stored under 75 to 96% CO_2, although it did show up in frankfurters stored at lower gas levels. —Food Eng, June, p193



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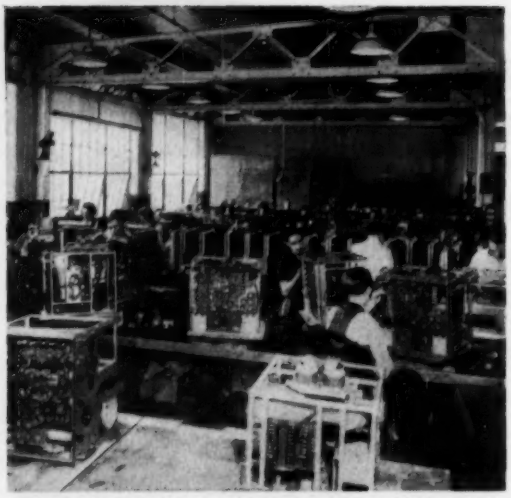

INDUSTRIAL RELATIONS plays an important role in today's business scene. A well-planned program of job evaluation can result in better employee relations and improved production. One job evaluation study Ebasco recently completed was for an Eastern electronics company.

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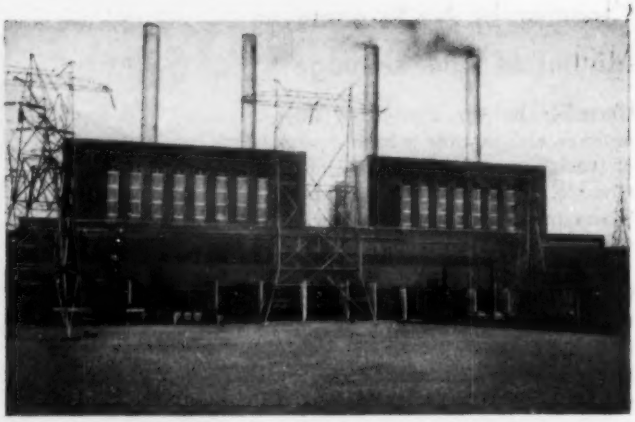
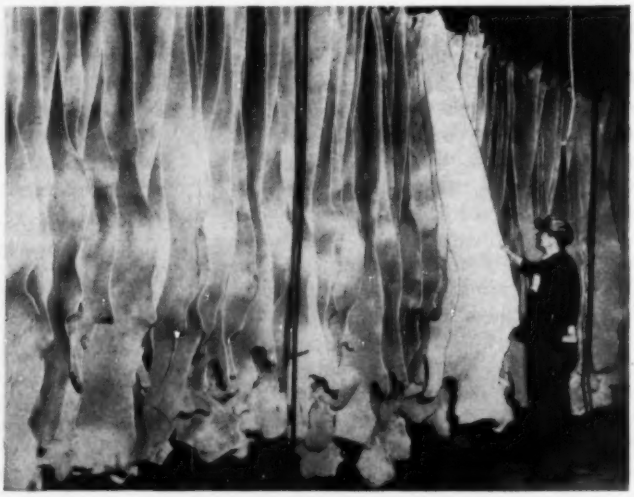


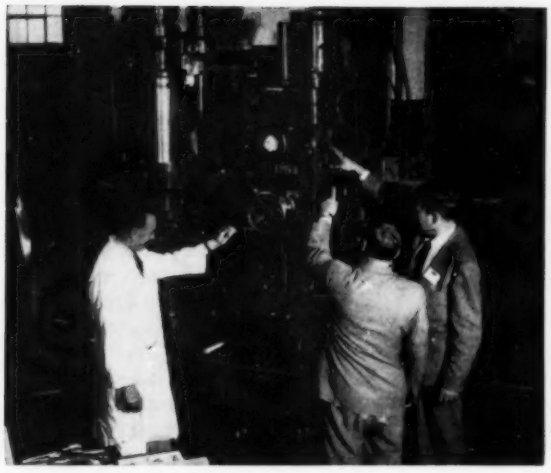
DESIGN AND CONSTRUCTION services are in constant demand by electric companies which provide dependable electric service throughout America. Ebasco handled the design and construction of the 375,000 KW Sunbury Steam Electric Station, shown above, for Pennsylvania Power & Light Co.

PENSION and retirement plans help attract new employees to a company and hold present ones. That's why more and more firms are installing them. Ebasco has prepared pension programs for many prominent companies in many different fields.

MARKET STUDIES are used by business and industry to provide a blueprint for sales and marketing programs. One such study made by Ebasco was of the effervescent teenage market—for one of the nation's largest manufacturers of soft drinks.

ENGINEERING SURVEYS often enable companies to reduce their production costs. Ebasco's engineering recommendations to a leather processing company, for example, resulted in abandonment of outgrown power facilities which were costly in manpower and space, and inefficient in the production of steam and electric power. This move produced annual savings many times greater than the cost of the survey.





From England, . . .

From Japan to . . .

Canada: Buyer Meets Seller

Canada's 6th International Trade Fair saw a vast display of goods attract much interest in a demonstration of competitive free-world trade

CANADA'S YEARLY EFFORT to bring buyer and seller together ended successfully June 12. This year's Canadian International Trade Fair held in Toronto saw more exhibitors take more space, sell more goods, and make more contacts than at any of the previous fairs. Significant in this year's fair was the fact that keen competition demanded harder selling and higher-quality goods.

North America's biggest trade fair showed machine tools and everything that goes to make up plant equipment and tools for the worker. All types of construction machinery and equipment were there. On the lighter side, there were many displays directed at the general buying public—displays that included jewelry, foods, textiles, art objects, glassware, sport equipment.

The machinery section again occupied the most space and drew the most attention. Canada's representation was largest, followed by Britain, Germany, France, Belgium, and the U. S. Sweden, Switzerland, Austria, Italy, and Denmark were also represented. Most exhibitors guaranteed short delivery dates. Most buyers thought terms and prices were right.

Construction machinery and equipment went outdoors again this year. Everything from small pumps to huge cranes was shown. A German exhibit stopped the crowd and held it. The exhibit featured a 1-ton power rammer. One-man operated, the huge rammer compacted earth with a spectacular display of power and noise.

Visitors to the fair consisted mostly of businessmen. They came to buy, to exchange ideas, and to see what the competition was doing. More than 30,000 businessmen came to see the show. About 90% were Canadians and Americans. To help them get the most out of their visit, the fair had specialists on hand to advise on market research, foreign exchange, and customs problems.

Representatives of different countries attending the fair had this to say:

Austria: We want to make contacts in the vast Canadian and U. S. markets.

Germany: We are anxious to sell consumer goods. The fair pro-

Trade-Fair Statistics

Representing 27 countries at this year's Canadian International Trade Fair in Toronto were 1,474 exhibitors. They booked a total of more than 264,000 sq. ft. of space.

Canada took three-fifths of the entire space and England about one-sixth; Germany 20,000 sq. ft.; U. S. 17,000 sq. ft.; and Belgium 6,500 sq. ft. France, Holland, Austria, India, Japan, Sweden, and Ireland each booked over 1,000 sq. ft. Other countries present were the Republic of Korea, Spain, Scotland, Finland, South Africa, Denmark, Italy, Jamaica, Norway, Switzerland, Hong Kong, Colombia, Guatemala, Pakistan, and Peru.

Of the total exhibit space, 100,000 sq. ft. was taken up by heavy machinery and machine tools and 45,000 sq. ft. by construction equipment. Household and sporting goods occupied nearly 20,000 sq. ft., and building and heating combined occupied 10,000 sq. ft.

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vides an opportunity to present our wares to the North American market. Our object is to close the dollar gap.

Holland: We have had favorable results from our exhibits. In fact, next year we expect to triple the space we now occupy. This year we presented mostly consumer goods. Next year we shall bring more machinery.

Ireland: This is our first year and we have had good sales. Our exhibits fall into the consumer-goods class—food, liquor, toys, glass, textiles. The fair should help us break into the dollar market.

France: We are exploring U. S. and Canadian markets for our machine tools, optical and scientific equipment. We have seen more interested U. S. visitors this year than last.

Spain: There has been much interest in our exhibits.

Sweden: We are here to solicit business and we have had good results.

Denmark: We are here to develop the Canadian market. Only goods that are seen are sold.

Finland: In 5 days 1,000 people made inquiries. Next year we shall bring heavy goods.

Japan: We are trying to increase trade with Canada. Many trial orders have been placed.

Italy: Sales exceed our best expectations. Visitors appear to be ready to do business.

England: We have had wonderful results with our machinery exhibits. Sales are high and good solid inquiries are coming in.

Canada: Our sales have been impressive in both machinery and textiles. A U. S. and Dutch firm plan to build plants here. Some exhibitors plan branch sales and distributing companies as a result of the fair.

Belgium: One of our optical manufacturers sold $25,000 worth of machines and got a contract to supply units worth $20,000 each month for a year to a U. S. firm.

Over-all, both visitor and exhibitor left the trade fair satisfied with the results he had obtained. For next year, exhibitors plan an even more intensive effort to capture some of North America's huge market. They are convinced they have built up a continuing interest in their products through the fair.

New Truck Spring Lets You Ride on Air Cushion

A new air spring made by General Tire and Rubber Company looks like a gigantic rubber cigar and is said to promote longer vehicle tire life. It also stops high-frequency vibration caused by improper spring tension. Because of the smoother ride of the rubber and air spring, General Tire says that trucks equipped with it could expect a longer life with less maintenance.

The air springs work in pairs. They are hollow, filled with 3 cu. ft. of air that flows freely inside each spring. Cable snubbers on each side of springs compensate for any upward movement of the vehicle body. Downward movement of the body is controlled by compressability of air in the rubber springs and an automatic valve system. The springs are fitted on tandem axles and run parallel to the vehicle body.

Air is metered from the vehicle compressor tank by two automatic valves, one for each rubber bellows. The valves are actuated by up and down movement of the chassis and inflate and deflate the rubber springs as needed.—Fleet Owner, June, p68

Sectionalized Gin Pole Speeds Tower Erection

A 25% boost in the speed of tower erection was logged by crews building a new power line in Pennsylvania recently. Credit for this achievement goes to Alex N. Shealy, transmission engineer of Pennsylvania Water & Power Co., who has developed a new sectionalized, metal gin pole. The 60-ft. gin is less than one-third the weight of a wooden gin of the same length and can lift tower sections weighing 6,000 lb.

The triangular-shaped pole is fabricated in five 12-ft. sections of welded aluminum alloy. Each of the three intermediate sections are straight, interchangeable, and weigh about 110 lb. Both end sections are tapered at one end and weigh 120 lb. because steel is used for some moving parts and at points of attachment.

Assembly of the gin can be in lengths of either 24, 36, 48 or 60 ft., and the full pole can be put together in less than 20 min. A half-ton pick-up truck can accommodate the disassembled pole; if terrain is too rough for vehicles, two men can carry sections with ease.—Elec World, June 8, p33

Change in Attitudes Marks ICC Congress in Vienna

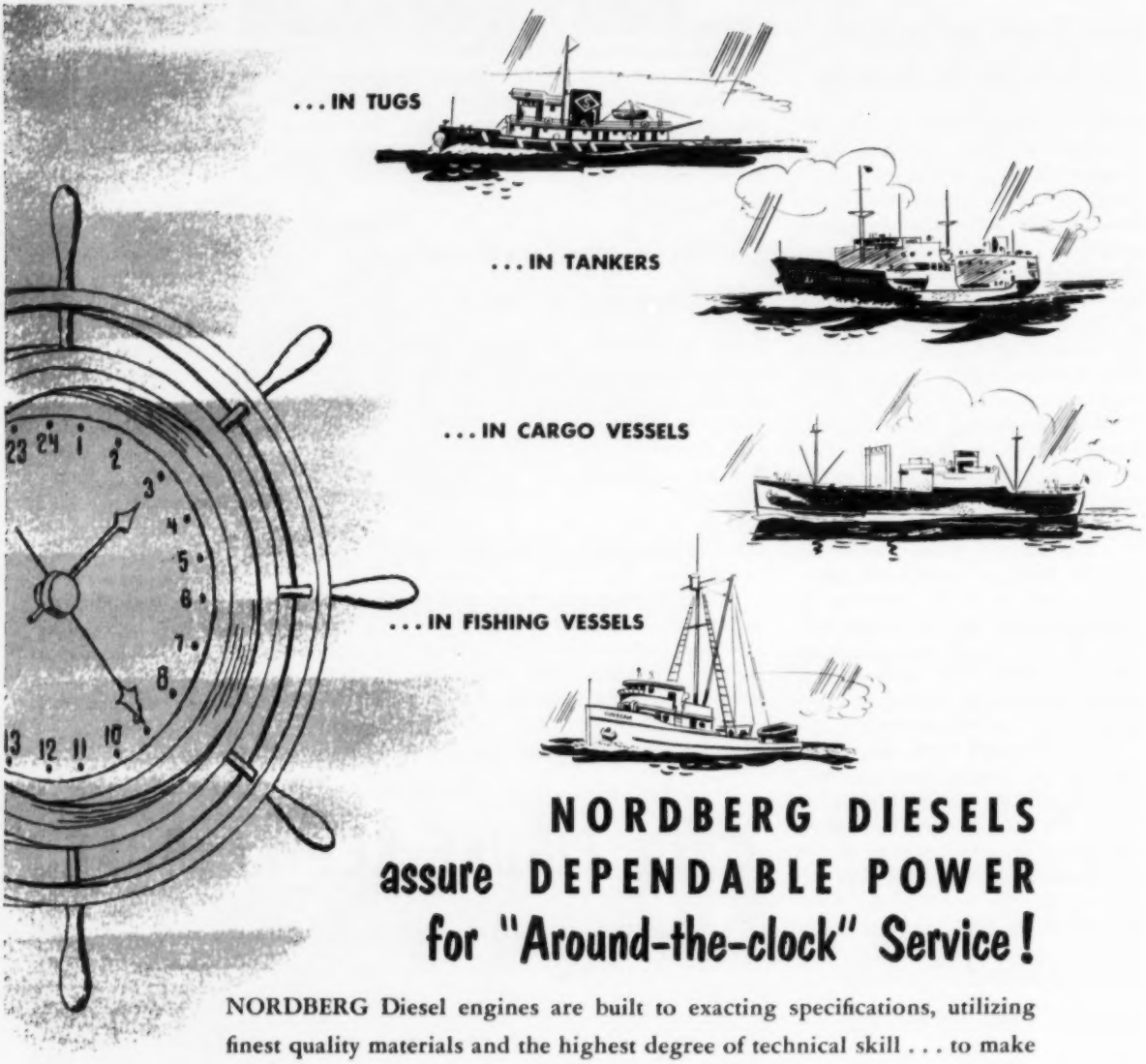
When delegations of businessmen from 30 countries met at the recent annual International Chamber of Commerce Congress in Vienna, the U. S. Council was on the defensive. The present trend of U. S. foreign economic policy, plus some fear of a U. S. recession, set the tone of the Vienna meeting. And it led to talk—mostly behind the scenes—of two developments that could harm U. S. interests:

- More reliance on regional trading arrangements that would tie Western Europe and the sterling area together.
- Increased East-West trade.

In informal conversations almost every non-American showed intense interest and considerable anxiety about (1) the outcome of the current debate in Washington over U. S. trade policies, and (2) the possibility of a recession in the U. S. within the next 12 months.

On the convertibility issue, there was a strange reversal of positions this year between Americans and Europeans. This year the Europeans wanted convertibility—assuming evidence of more liberal American import policies. And the Americans urged a go-slow attitude.

More than this difference, there was an immediate threat to U. S.-European relations—the threat of a split on the East-West trade issue. The Vienna Congress ended with the Europeans, in general, feeling that trade with the dollar world is more likely to go down than up in the next year or so, while there is a good chance that East-West trade can expand.—Business Wk, May 30, p126



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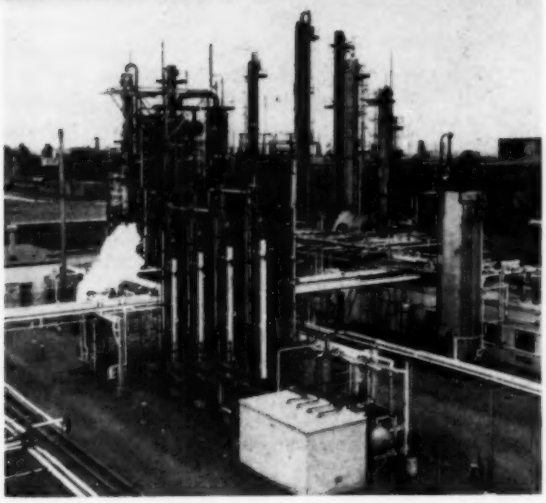
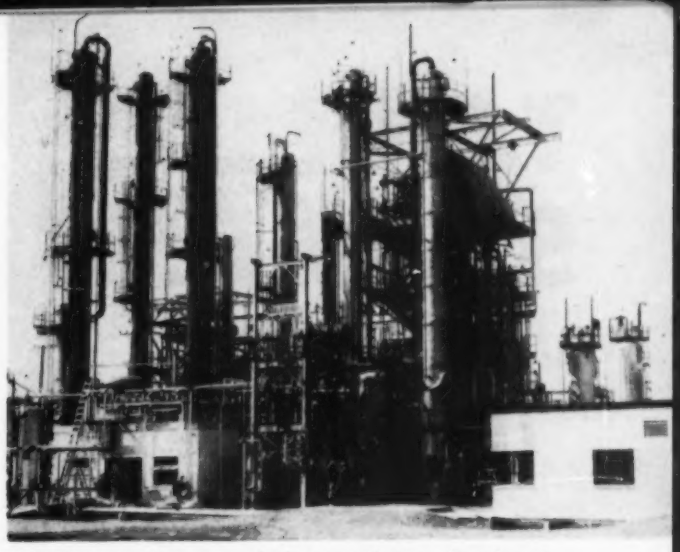
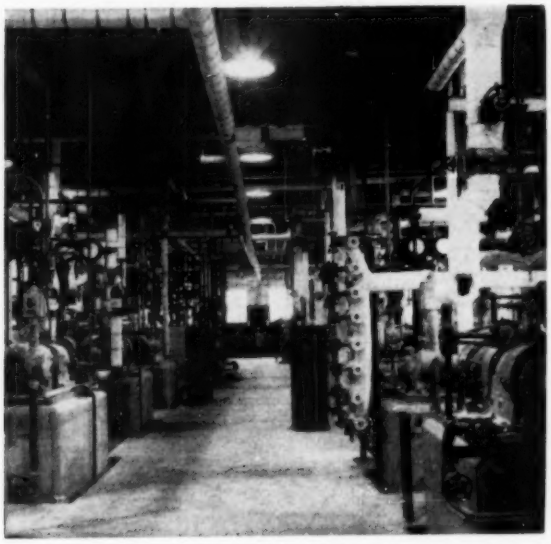


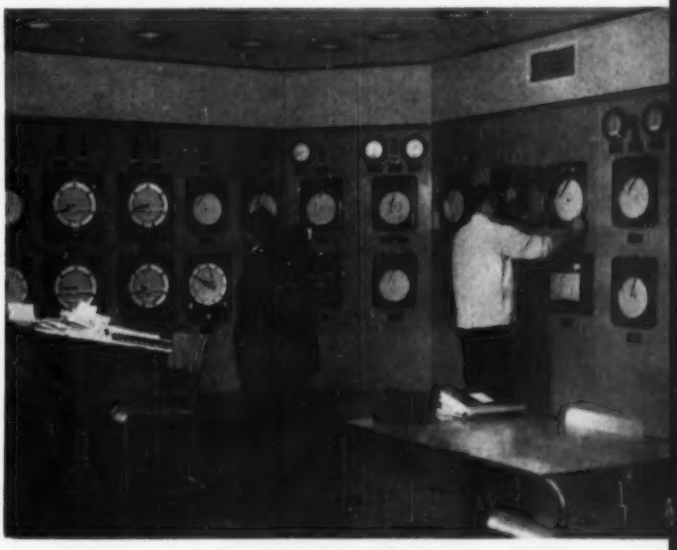
OXIDATION of cumene to cumene hydroperoxide, first step in new plant, is carried out in column reactors



CLEAVAGE of cumene hydroperoxide to phenol and acetone is done in reactors at right; stills are at left



PUMP HOUSE, located in the middle of the still columns, has 75 pumps painted in different colors to identify them



CONTROL ROOM, nerve center of the whole plant, shows all operating variables by chart, dial, pointer, or light

World's First: Cumene to Phenol

The chemical industry has been watching with excitement the swing to a new process, the production of phenol from cumene.—An original Digest article

CANADA CAN BOAST of many achievements in the world of trade and industry. Her total production of goods and services has doubled since 1939, and she is now believed to be at the threshhold of a new period of major, dynamic expansion.

She produces 90% of the free-world's nickel, two-thirds of its asbestos, half of its platinum, more than half the world's newsprint. She harvests the world's fourth largest crop of wheat, nets the world's fifth largest catch of fish, ranks second in zinc and gold production, third in silver, fourth in copper, and develops over 10% of the world's electric power. These resources have established Canada as the world's third largest trading nation, ranking in foreign trade behind only the United States and Britain. And she does all this with

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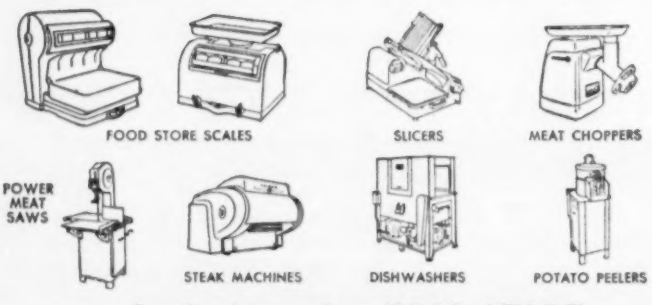

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less than 1% of the world's population.

Canada now tallies another first with the recent opening of the world's first plant to manufacture phenol (carbolic acid) from cumene, a product of its domestic petroleum industry. And this is the first time too that synthetic phenol has been made in Canada.

The new plant, located near Montreal, is owned by B. A.-Shawinigan, Ltd., a joint venture organized in 1951 by the British American Oil Co., Ltd., and Shawinigan Chemicals, Ltd. Built by M. W. Kellogg Co., it employs a process under license from Hercules Powder Co. and Distillers Co., Ltd., England.

B. A.-Shawinigan's plant is the first to get into production of the seven being built to manufacture phenol from cumene. Other companies include Allied Chemical & Dye (McG-H Digest, Dec '51, p29), Hercules Powder, Standard Oil of California (Oronite), Rhone-Poulenc and Progil in France, and Phenol-Chemie, Gmb.H. in Germany.

At B. A.-Shawinigan, cumene is piped into the plant from the neighboring British American oil refinery. It is there made by alkylating benzene with propylene. The propane-propylene stream is first given a caustic wash to remove sulfur compounds and then reacted with benzene.

Cumene Oxidation

Cumene received from the refinery is oxidized with air at about 130°C. to form cumene hydroperoxide. The hydroperoxide is then decomposed in a cleavage reactor, in the presence of sulfuric acid as a catalyst, to form phenol and acetone.

Fractional distillation carries off acetone overhead and phenol at the bottom. Minor amounts of acetophenone, alpha-methylstyrene, and mesityl oxide are also produced. Unreacted cumene, after treatment to reduce the methylstyrene contaminant, is recycled back to the oxidation towers.

Yields of phenol from benzene are claimed for the cumene process to equal those obtained from the more common chlorination and sulfonation processes. The latter

two processes require 1 lb. of benzene per pound of phenol, as compared with 1.04 lb. of benzene for the cumene process. Also, the manufacture of acetone by the isopropyl alcohol process requires 1.01 lb. of propylene per pound of acetone, as compared with 0.953 lb. for the cumene process.

Other advantages claimed for the process include lower capital investment, lower processing costs, and simpler waste disposal. Outdoor-type construction, certainly unusual in a climate as cold as Canada, reduced building cost; it also gives added advantage of preventing undue concentration of vapors. On a strictly comparable basis, the cumene process appears to have considerable lower capital investment costs than other processes as no separate isopropyl alcohol-acetone plant is required.

What the Plant Will Make

When B. A.-Shawinigan gets into full production, it will produce yearly 13-million lb. of phenol, 8-million lb. of acetone, 1-million lb. of alpha-methylstyrene, and several hundred thousand pounds of other by-products. Current Canadian needs for phenol and acetone will be more than filled by this output.

The phenol will go into disinfectants, synthetic resins, adhesives, weed-killers, phenolic detergents, pharmaceutical preparations. It is a versatile chemical intermediate and is important in solvent extraction, particularly in the refining of lubricating oil.

The acetone, which is primarily a low-boiling, volatile solvent, will be used to make other chemicals such as diacetone alcohol and its derivatives, phorones, and methyl methacrylate. The cellulose acetate industry will consume a considerable amount as it is a solvent for the flake form of the acetate. Acetone will go also as a solvent into paints and lacquers, paint and varnish remover, lubricants.

Alpha-methylstyrene, most important of the by-products, will fill a demand as a modifying agent in styrenated oils and as a component of copolymers. Acetophenone will serve as a solvent for cellulose ethers, esters, and resins, and mesityl oxide as a solvent for nitrocellulose and vinyl-type resins.

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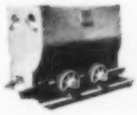

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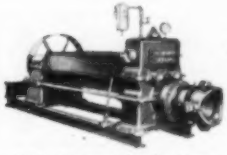

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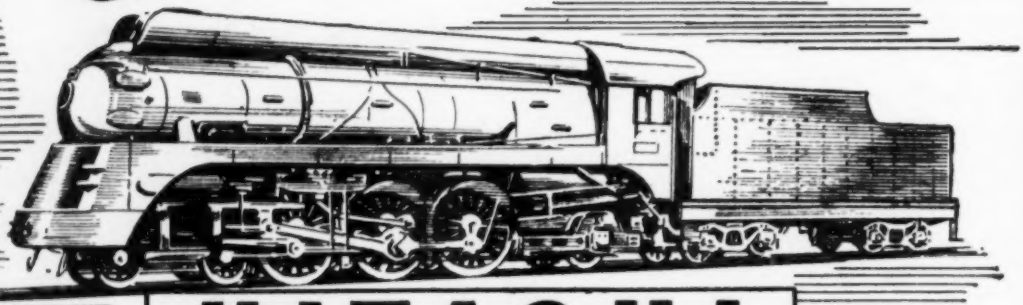

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TECHNICAL SHORTS

World Television — Intercontinental television may be just over the horizon according to one executive in a U.S. television trade association. He claims high-powered microwave relays and submarine cables with transistor amplifiers will soon do the trick.—Electronics, June, p14

Insecticides and Sweet Potatoes—Recent experiments show that sweet potatoes grown with benzene hexachloride, either dusted on plants or used as soil treatment, had off flavor. Eating quality was impaired, acceptability low.—Food Eng, June, p198

All-fluid Brake—New brake announced by Federal Fawick Corp. utilizes air braking applied by pedal for normal driving and hydraulic braking applied by lever for emergencies. Driver can actuate the two systems separately or together. Braking action is transmitted through a two-step piston. —Prod Eng, June, p158

It Doesn't Drip

Her name is Penny Johnson and that look of wonderment is for American Can Co.'s new can that doesn't drip. The can has a special lining that permits packaging of edible oils, liquid starches, furniture polishes, shampoos. It uses no tin and can be lithographed all around. Its dripless nozzle is made of aluminum.—Chem Wk, May 9, p44

Engineers Get Giant Bulldozer

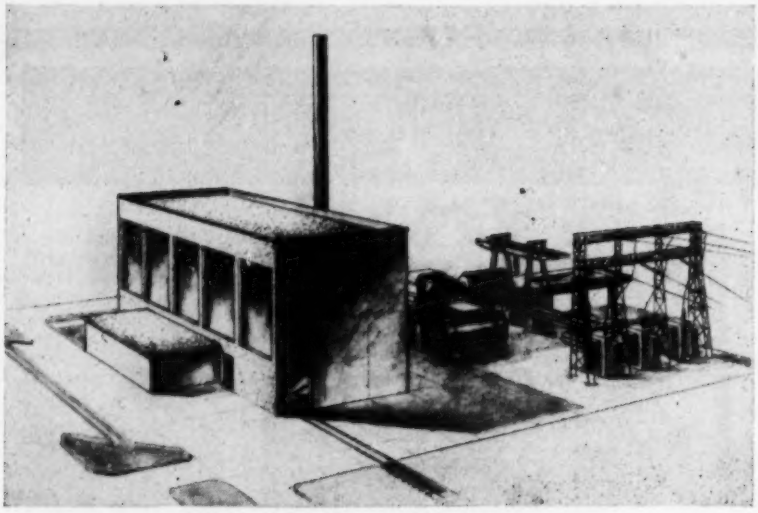
The "Bull Moose," a new massive tractor bulldozer designed for operating scraper equipment and as a prime mover, has been delivered to the U. S. Corps of Engineers by Allis-Chalmers Mfg. Co. The vehicle has a dozer blade 11 ft. wide and 4 ft. high. Bull Moose weighs 51,000 lb. and can travel up to 25 miles per hr. pulling 65,000 lb.—Const Meth & Equip, June, p190

Sticks to Coal—Du Pont plans commercial use of a new continuous process to make synthesis gas. Coal is ground, fed to ceramic-lined furnace, and burned in presence of steam and "deficiency" of oxygen to form carbon monoxide and hydrogen. Gas will be used to make ethylene glycol, ammonia, other nitrogen products.—Chem Wk, June 6, p36

Cotton Mercerized in Skeins—New apparatus for experimental mercerization of cotton yarn in skeins has been built at Southern Regional Research Laboratory in New Orleans, La. Equipment consists of two balance-type machines suitable for treating skeins weighing up to 1 oz. and a frame-type machine capable of treating lots up to 12 oz. Setup makes it possible to tell in advance what types or varieties of cotton are most suitable for commercial mercerization.—Textile World, June, p290

Cleans Bus, Saves Money—To save the cost of tedious manual sweeping of buses one U. S. transit company uses huge Buck Cyclone cleaner. Fabric hood from big cleaner standing on garage floor fits around open bus door. Rear windows in bus are opened, cleaner is turned on, and all debris in bus comes pouring into cleaner. Cleaning time is only a few minutes—Bus Trans, June, p58

New Ore Car—Special construction of Bessemer & Lake Erie Railroad's ore car facilitates loading, dumping, and thawing. Car has a bottom door opening. Lading is placed directly between rails. Bottom or floor sheets slope 50°. Holes in slope sheet permit introducing steam to thaw frozen ore. Capacity is 70 tons. Space occupied by new car is 50% less than same-capacity conventional car. —Eng & Min J, June, p100



ATOMIC POWER plants may look like this as soon as . . .

Atoms Pass a Milestone

Atomic Energy Commission reports results of industry team studies of atomic reactors and a breeder that makes plutonium from U-235

THE U. S. Atomic Energy Commission has released several reports made on nuclear power generation by industry teams. The teams have been studying ways of putting atomic energy to work for civilian use.

What they have found is encouraging, putting atomic-power generation closer to reality. Though they have not yet found a way to make it cheap enough to compete with today's fuels, the reports show the glaring faults in some systems and the virtues in others.

Commonwealth Edison Co. and Power Service Co., two big power-generating companies, found that both a helium-cooled, graphite-moderated reactor (a moderator controls the energy; compare it to an ordinary throttle valve in a power plant) and a heavy-water-cooled, heavy-water (D_2O) moderated reactor could be built and operated. Both are feasible. But for sake of economy the heavy-water-cooled reactor was considered the better.

Another report was made by the Pacific Gas and Electric Co., a West Coast power utility, and Bechtel Corp., engineers. Their joint studies were made on a water-cooled thermal-converter reactor and a liquid-metal-cooled fast breeder reactor.

Of the two reactors, this team compiled evidence heavily in favor of the liquid-metal-cooled type as being most attractive as a power producer. It conserves the existing supply of uranium and appeared to be adaptable to present-day steam conditions.

Dow Chemical Co. and Detroit Edison Co., a Midwest utility, also favor the liquid-metal-cooled fast breeder reactor and added that true fluid fuel would be best. But Dow-Edison plans to continue its research using solid fuel because of certain disadvantages in using fluid fuel. The eutectics of uranium or plutonium with melting points of 500° C. and higher is probably the biggest of them and presents problems not yet solved.

The Monsanto Chemical Co.-Union Electric Co. team emphasized that any study made of atomic power generation relied heavily on information accumulated by AEC. And the AEC's primary purpose is to produce military plutonium, not power.

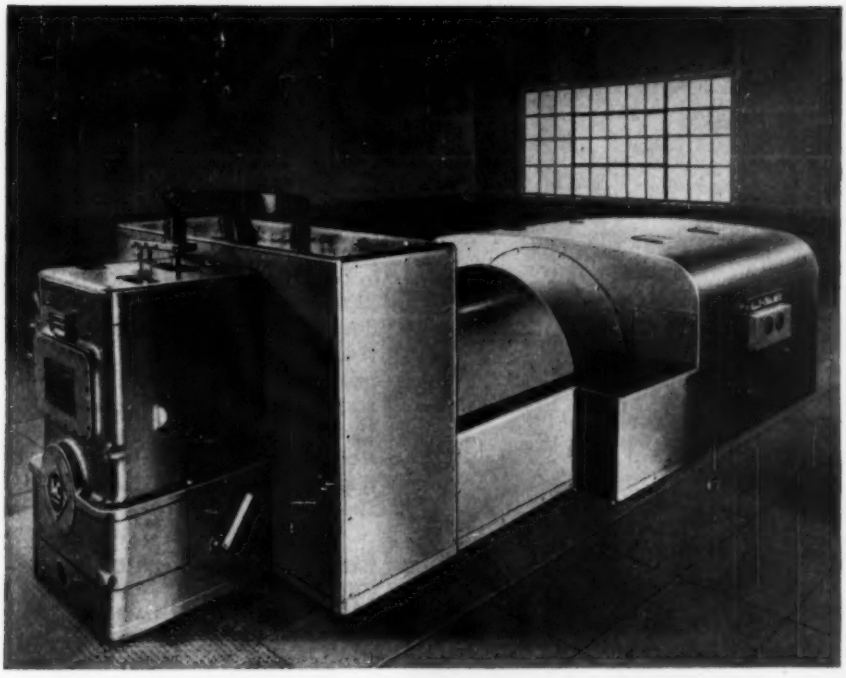
The report said that there are a number of problems involved in atomic-power generation that, if not solved beforehand, would make it unwise to design a nuclear-reactor system at all. This team based its studies on the type of reactor already operating at the AEC's Hanford plant—a type cooled by sodium. It chose this type not because it seemed ideal, but because there was more information available on it.

The commission also revealed that the double-purpose "breeder" reactor recommended by two of the teams was developed some time ago by two doctors, Walter Zinn and Harold Lichtenberger and their associates working at Argonne National Laboratory in Idaho. The breeder at Argonne has been burning the usual fuel, consisting of useable (fissionable) U-235 and unuseable (non-fissionable) U-238, and at the same time it has been converting U-238 into fissionable plutonium, PU-239. And it has been doing it at least as fast as the U-235 is consumed.

If operated at peak efficiency, the breeder reactor can even convert U-238 into plutonium with a better than one-for-one exchange. Since plutonium can fuel other reactors, the theory is that the breeder reactor could make enough fuel to supply other plants and still have a surplus.

Good as the breeder reactor sounds, no one is yet sure just what it would cost to run it. Estimates have been made that put cost of breeder reactor power at one-third of a mil (1/10 cent) per kw.-hr., plus cost of a reprocessing plant needed to turn irradiated fuel coming from the reactor into plutonium. What actual operating costs would be, no one knows.

But it is known that breeding is a slow process and that a reactor may have to operate for 5 years or longer before it can yield as much fuel as was invested in it initially. The real significance of breeding is that now all uranium can be used for atomic fuel whether it is fissionable in its natural state or not.—Elec World, June 1, p68; June 15, p103 & 114; Nucleonics, June, p49



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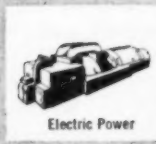
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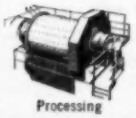
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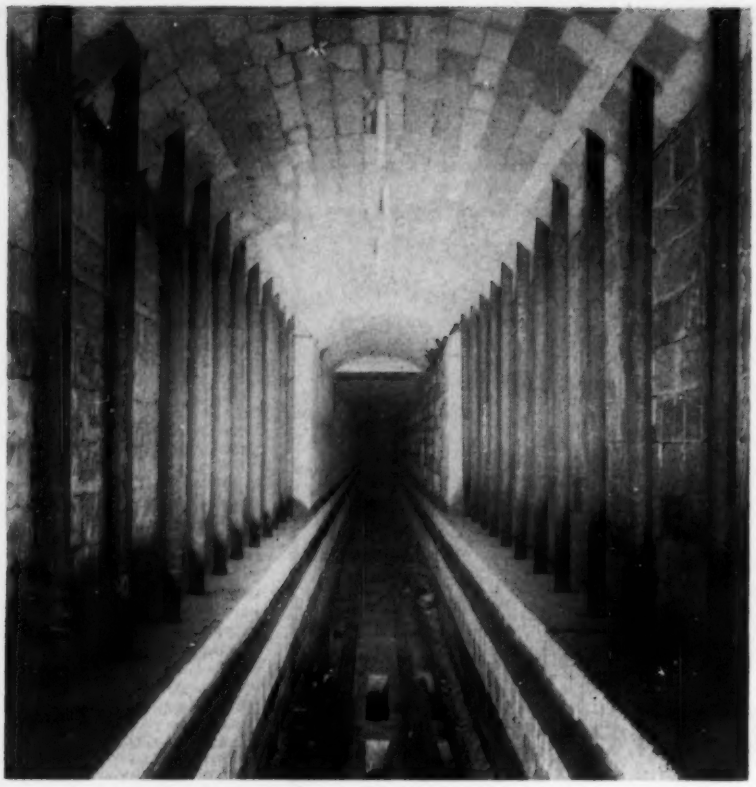

TUNNEL KILNS like this one may be adapted to a new. . .

Steel-Making Method

Don't be too surprised if someday you see ceramic plants making steel—no, not with converters or open-hearths, but with ceramic tunnel kilns

STEEL FROM TUNNEL KILNS sounds a little farfetched, but that is the discovery the Canadian Ontario Research Foundation made about a year ago. Successful experimental work recently completed confirms that controlled-density steel can be made in such kilns.

No change in kiln design or operation is needed with a standard pottery or high-temperature brick kiln. As long as the kiln will operate between 2000° and 2200° F., all that is required is a supply of suitable saggers that will withstand the temperature and be air-tight.

The method consists of (1) grinding and blending the ore to get steel density desired, (2) mixing with a carburizing compound—coal, charcoal, coke dust, or sawdust, (3) preparation of mold made of sand, graphite, resin-bonded sand, or even paper, (4) packing in saggers, and (5) passing saggers stacked on kiln cars through the kiln in a 5-hr. period.

The steel product, whether part, bar, slab, or sheet, has two advantages—low cost and lightweight. Density can be varied to suit product uses.

Low-density products may be given mechanical properties comparable to those of wood. They can be worked with wood-working tools and may substitute for plastic and zinc die castings.

Medium-density products weigh about the same as magnesium or aluminum and may be considered a low-cost substitute for them.

High-density products may substitute for cast-iron, malleable-iron or pressed iron-powder parts. As the metal is never molten but is changed to steel by direct reduction, alloys can be added to the steel surface. Thus the process can produce carbon steel parts with high-alloy, heat-resistant or high-alloy, stainless-steel surfaces.

Pipe also can be made by this process. A solid bar can be reduced so fast that the mixture in the center is not affected. It can be poured out after the bar is removed from the kiln, leaving a hollow pipe. If a higher carbon content is desired, the pipe may again be passed through the kiln.—Ceramic Ind, June, p112

Radiant-Roof Furnace Makes Grain Uniform

Pan-type annealing furnaces present the problem of keeping work temperatures uniform across the hearth. A new furnace, built by Selas Corp. of America and installed at Drawn Metal Tube Co., overcomes this condition by compensating for non-uniform heat losses.

A gas-fired radiant furnace roof compensates for losses by developing heat patterns. The roof has 27 heavy-duty radiant burners arranged in lateral rows of four and five, alternately.

Burners in each row are throttled from the sides toward the center to get work-temperature uniformity. Each burner then develops its proportionate share of heat as zoned temperature controls call for more or less heat.

Work annealed is copper, brass and nickel-silver tubing in diameters from $\frac{1}{8}$ to $\frac{3}{4}$ in. and wall thicknesses of 0.005 to 0.032 in. Tubing loaded 1 to 3 in. deep in a steel pan is drawn through the furnace in a 20-min. heating cycle. Stress annealing is done at 600 to 800°F. and intermediate and full annealing at 1000 to 1200°F.

Significance of keeping the work temperature uniform is that samples taken throughout the pan load shows no grain-size differences. Low-leaded high brass, for example, is given a uniform annealed grain size of 0.040 mm.—Iron Age, Apr 23, p144

Gasoline Additive to Boost Engine Power

Shell Oil Co. has developed a new gasoline additive called TCP. Shell claims it will give the average car up to 15% more power, more mileage, and from 50 to 150% longer life for spark plugs. Gasoline with the new additive is said to clean old plugs and cut down on preignition.

The new additive is a cresyl compound named tricresyl phosphate, made by Monsanto Chemical Co. Special pumps and other blending equipment are needed to blend TCP with gasoline. Price will be slightly higher than present premium gasoline.

Shell acclaims the additive as the "biggest development in motor fuel since the introduction of tetraethyl lead 31 years ago." It is the result of research Shell began for the U. S. Air Force over 5 years ago and has been used in military aircraft for more than 2 years.—Auto Ind, June 1, p36

Bolts Conquer Mean Top

When a bad top began to crush wood posts and jeopardize profitable mining, the Red Parrot Coal Co., W. Va., found its answer in roof-bolting. The roof strata could not be bound together to form a beam, but had to be suspended with long bolts from the solid sandstone above.

A crawler-mounted unit, built at the mine to carry the air compressor, tools, and the water tank for wet drilling, licked the difficulties with a soft and rather wet bottom and improved bolting performance over the original compressor arrangement. Time studies also were an important factor in developing an efficient procedure.—Coal Age, June, p89

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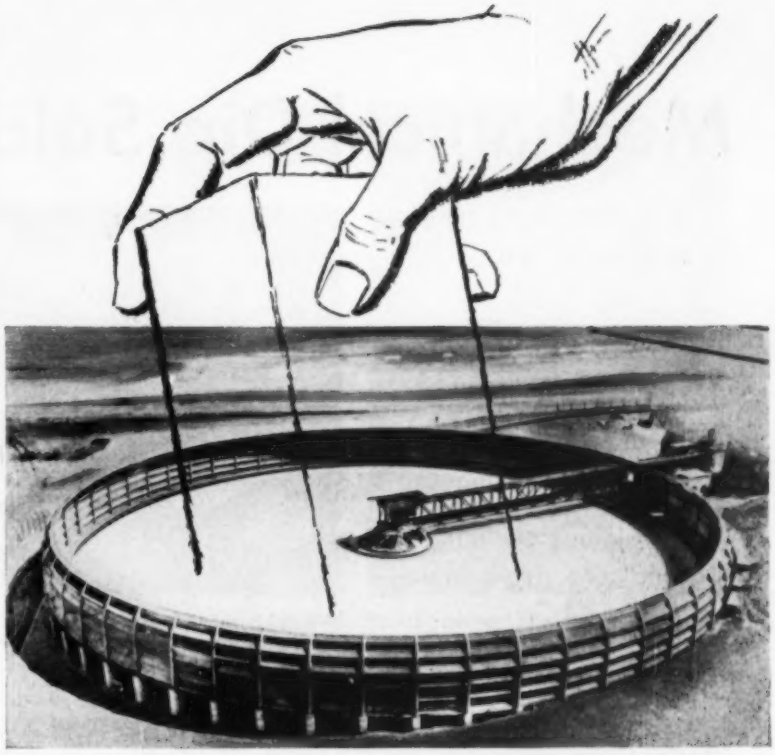

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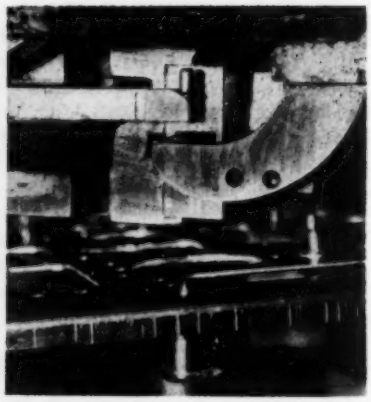
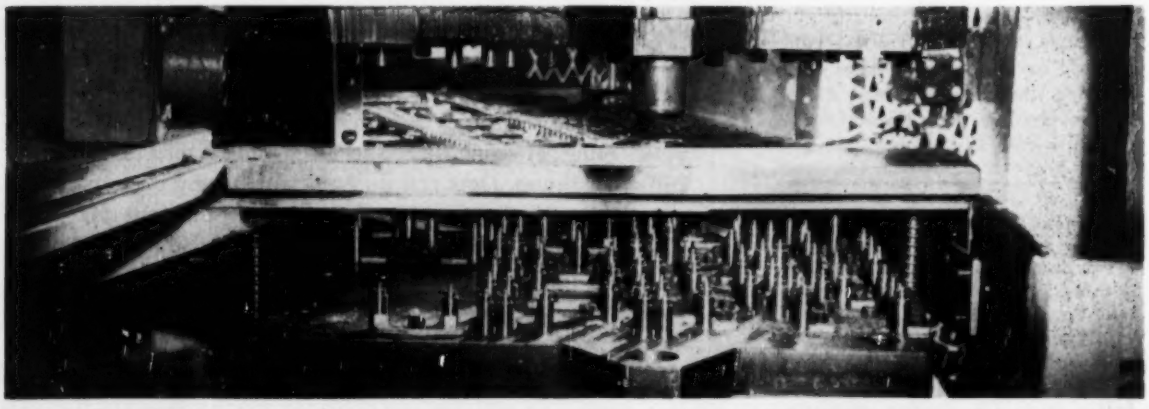
SPECIAL tubular pins with hole in top for solder entry are riveted to chassis for grounding leads.

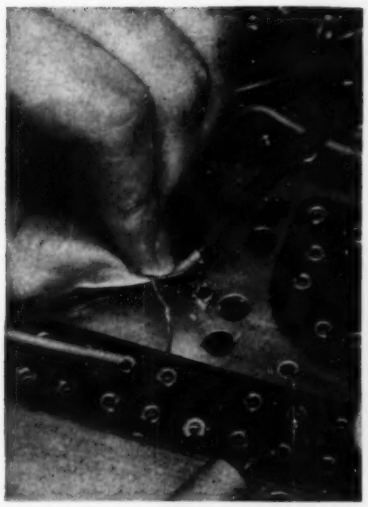


CLOSE-UP of ground riveter shows one of these special pins about to be pushed through washer into chassis.

ROTARY CONVEYOR, called a pipe organ, has capacity of 300 units per hour. Moving chassis receive special sockets and pin plates designed especially for dip soldering and equipped with captive rivets. Rotating table indexes to the next station every 12 sec. Components are hand-loaded into open tops of pipes leading to conveyor.



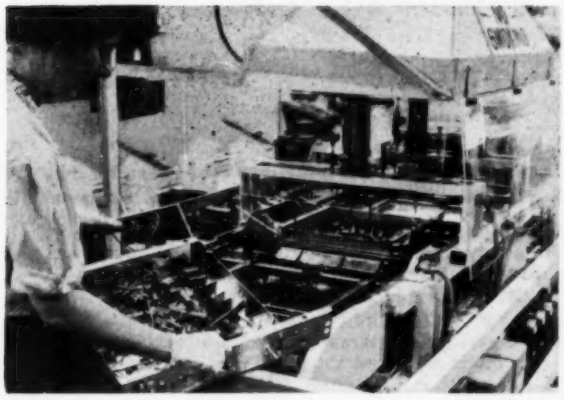
FORTY-TON PRESS with rivet dies clinches all captive rivets of components in one operation, doing the work of 93 individual riveting machines at once. If chassis is not properly loaded into dies, phototube at left keeps dies from closing. From here, the chassis goes to line where under-chassis parts are put in.



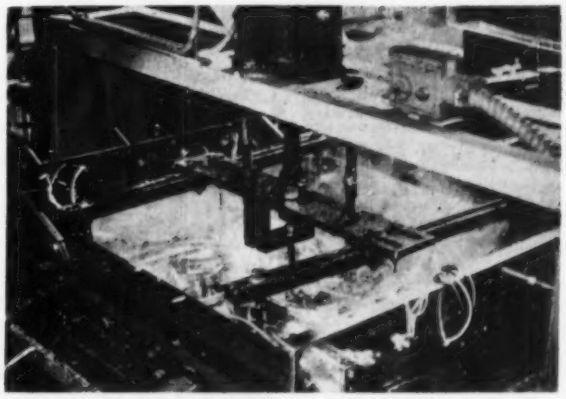
VIEW of underside of chassis shows how leads of components are put into pins. Note shield in ground pin.

PUNCHED copper strips are also put into pins. Above chassis pieces will be fastened to strips after dipping.

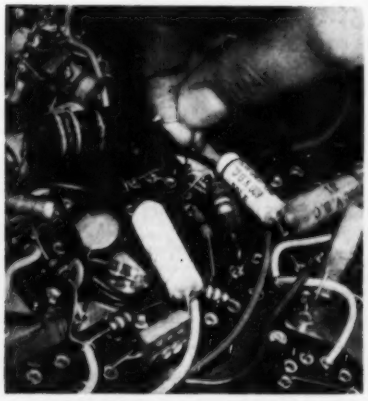
TUBE socket shields, looking like combs, slip into pins too. Dip soldering will secure them in place.



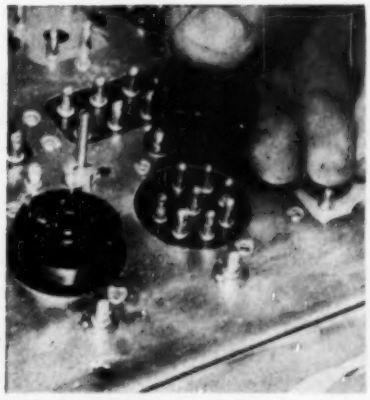
CHASSIS is now loaded onto conveyor, top side down, and carried to solder pit. Lucite screen draws off resin fumes as chassis is lowered into molten solder.



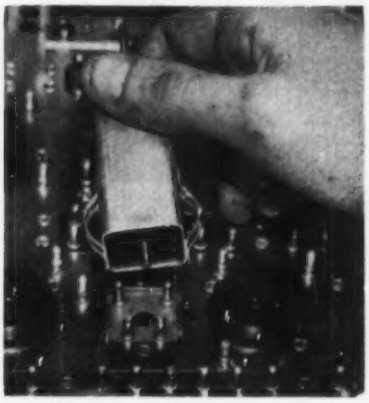
SUSPENDED over molten solder, chassis is lowered until open-ended pins barely touch the surface. Capillary action draws solder into 424 pins, securing 1,000 leads.



PRESSURE on resistor lead shows it to be held firmly. Pins will accommodate up to four leads comfortably.



ABOVE-CHASSIS view shows pins sticking up ready to have special tube adapter put on with vibrator.



OTHER components, like this transformer, clip quickly into place on chassis.—Electronics, June, p130

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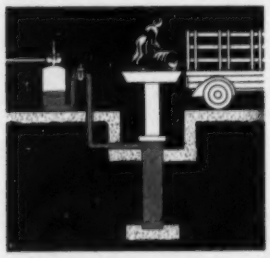
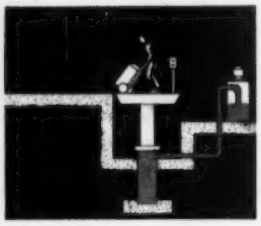
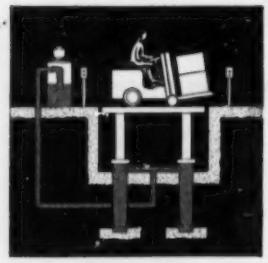


This drawing shows the operating principle of the GLOBE Loading Lift. Installation plans vary to meet the customer's needs.

A GLOBE Ramp Eliminator speeds the movement of materials from one level to another; eliminates dangerous ramps and gangplanks.





Here you see the operating principle of a GLOBE Bridge Lift. In-plant traffic jams and costly detours are eliminated.

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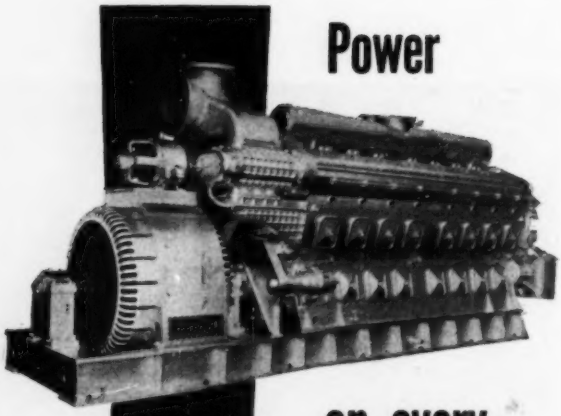
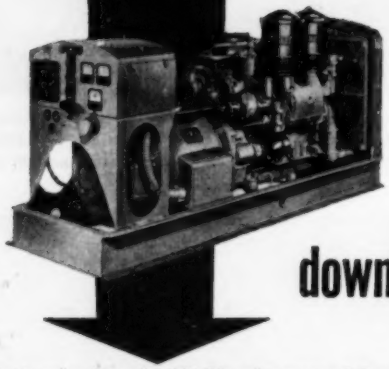


on every



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Profit-Sharing System Helps Boost Production

Labor feels management should share with employees profit arising from increased production. One type of plan, where a bonus is geared to total payroll savings, is the Scanlon plan. It works especially well in medium-sized manufacturing companies where teamwork between employees is important.

The Scanlon plan aims to increase over-all production and consequently to keep down the company's payroll by convincing workers that they can achieve more by pulling together as a team than they can by individual rivalry.

This is done by showing each worker that the more he produces as an individual, the more the group will be rewarded. By putting emphasis on group work, men get the idea that what is good for one is good for all, and conduct themselves accordingly.

The bonus is determined by the difference between the sales and the payroll each month. A fixed percentage, agreed to by the union, is distributed as a bonus according to the basic pay of each worker.—Am Business, May, p20

Improved Powder Torch Raises Cutting Speed

The iron-powder process for cutting stainless steel has been improved by changing the means of introducing the powder. This change was announced by Linde Air Products Co. at the recent annual convention of the International Acetylene Association.

The powder was previously introduced into the oxygen stream inside the tip and discharged through an annular passage between the preheat ports and oxygen bore. All the powder was not preheated, so the torch tip had to be held well above the work surface to permit the powder to ignite.

But now the torch tip can be held near the surface as the powder is externally fed. It is directed through the preheat flames and enters the oxygen at a point close to the tip. All the heated powder particles are ready to ignite when they reach the oxygen stream.

Results are faster cutting, less powder consumed, and a lower rate of conveying-air flow. Less air means less dilution of the cutting oxygen with nitrogen. Field trials of powder scarfing have shown speeds three times those obtained with internal feeding.—Weld Eng, June, p42

Hand-Hydraulic Timber Setter Cuts Costs

Now every mine timbering crew can be converted to a mechanized unit economically. "Timberlift", made by Ruger Equipment, Inc., does the job. It is a simple bolt-and-nut assembly of mast, cantilever boom, timber-holding cradle, and cradle stabilizer mounted on a flat-bed timber car. A hook on the end of the boom picks up timber, sets it on standards. Hook is detached and boom is swung away from timber. Shown here, timber in cradle at end of boom is being positioned.—Coal Age, May, p106

Plastic Filter Press

Properties of improved and newly developed plastics are widening their use by designers. Typical of this trend is an industrial filter unit made by Hercules Filter Corp.

Rigid vinyl plastic has replaced metals in such parts as filter leaf frames, nuts and bolts holding the leaves in place, the heel plate, and various pipe fittings. A flexible vinyl sheet protects the inside of the tank from corrosion.

Hercules chose vinyl plastics because of their high corrosion resistance. Tests showed that a 140° F. mixture of manganese sulfate and manganese dioxide eats through stainless steel in a few hours. It has no effect on vinyl.

Another benefit: plastics cost one-third to one-fourth as much as the metal alloys formerly used.—Prod Eng, June, p231

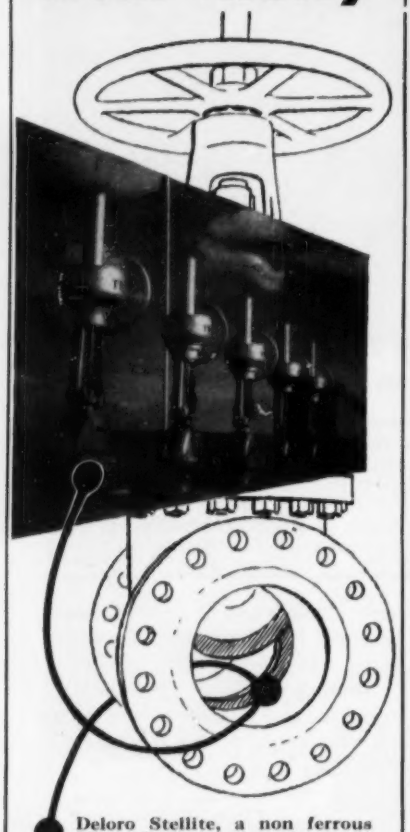
Improved Distillation

Better thermodynamic efficiency, lower pressure requirements, and a smaller column with fewer trays are claimed for Universal Oil Products Co.'s new process.

It involves compression of overhead vapors to a temperature and pressure high enough to allow their use as the heating agent in a fractionating column reboiler. Vapors give up latent heat in the reboiler, evaporate bottoms for the vapor return to the column, and are themselves partially condensed.

The vapors, after passing through an expansion valve, provide overhead product and liquid reflux for the column. Additional cooling, if needed, is provided by an external refrigerated cooler in the line ahead of the reboiler.—Chem Eng, June, p370

DELORO STELLITE
stops wear-worry



Deloro Stellite, a non ferrous alloy of cobalt, chromium and tungsten, can make your mechanical parts last from 300% to 1000% longer when wear is caused by corrosion, abrasion, erosion or high temperatures: supplied as castings, as hard-facing rod and on leading manufacturers' equipment.

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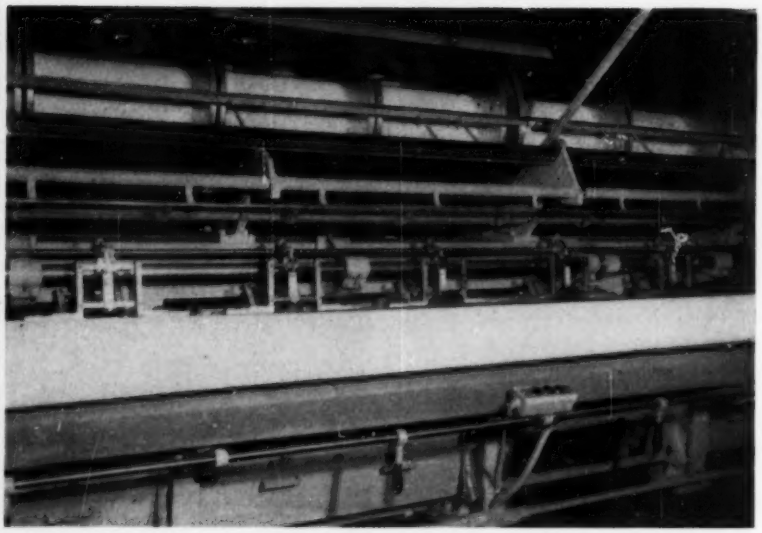

Tricot Let-Off Useful for Novelties

Kidde-Aveco tricot machine, built by Kidde Mfg. Co., Inc., knits 15-denier nylon at 560 courses per min. An improved cam system not only has increased speed but gives a smoother operation. A modification of the let-off motion that is controlled from the tension rail allows the beams to stop very quickly as the demand for yarn stops. This feature is useful when one guide bar makes a zero stitch.—Textile World, June, p111

Molten Metal Spray Produces Circuits

A mass-production process for forming electrical circuits involves spraying molten copper, aluminum, or silver on the parts through special masks. As developed by Spraywire Laboratories, Inc., Minneapolis, Minn., the process starts with cutting a stencil identical to the wiring design to be produced.

The stencil is applied to a dielectric panel and sandblasted to form grooves along the desired wiring location. Molten metal is sprayed through the stencil into these grooves with a standard metallizing gun, and the stencil is removed to complete the process.

The stencils are made from a special masking tape developed for the Spraywiring process by Minnesota Mining & Mfg. Co. The tape is adhesive on one side, and has a sufficiently hard surface to withstand the effects of sandblasting and metallizing. Each stencil is used only once, but cost can be held down in production by die-cutting the stencils in continuous strips.

If feed-through eyelets are applied to the panel beforehand, components can be assembled before the sandblasting operation. The leads exposed on the wiring side will then be sandblasted along with the eyelets and grooves, and the metallizing operation will produce permanent joints. This method eliminates the need for soldering. —Electronics, June, p262

New Ideas for Industry

▶ **Viscosity tester,** called the Ultra-Viscoson and made by Bendix Aviation Corp., applies ultrasonics for quick measurement. A thin steel blade is vibrated at ultrasonic frequency in the liquid. Viscosity effect on blade vibration is transmitted to a computer, which is connected to a viscosity recorder or a control device.—p64

▶ **Dual frequencies** in an induction heater have reduced capital outlay and operating costs for heating billets to forging temperature. The heater, made by General Engrg. Co., Ltd., of Toronto, Canada, uses two sets of continuous coils; a low-frequency heat tunnel is followed by a high-frequency section. Low-frequency current is taken directly from the 60-c. line. Low-frequency coils heat billets to 1400°F., and high-frequency coils raise them to forging temperature of 2200°F.—Iron Age, Apr 16, p113

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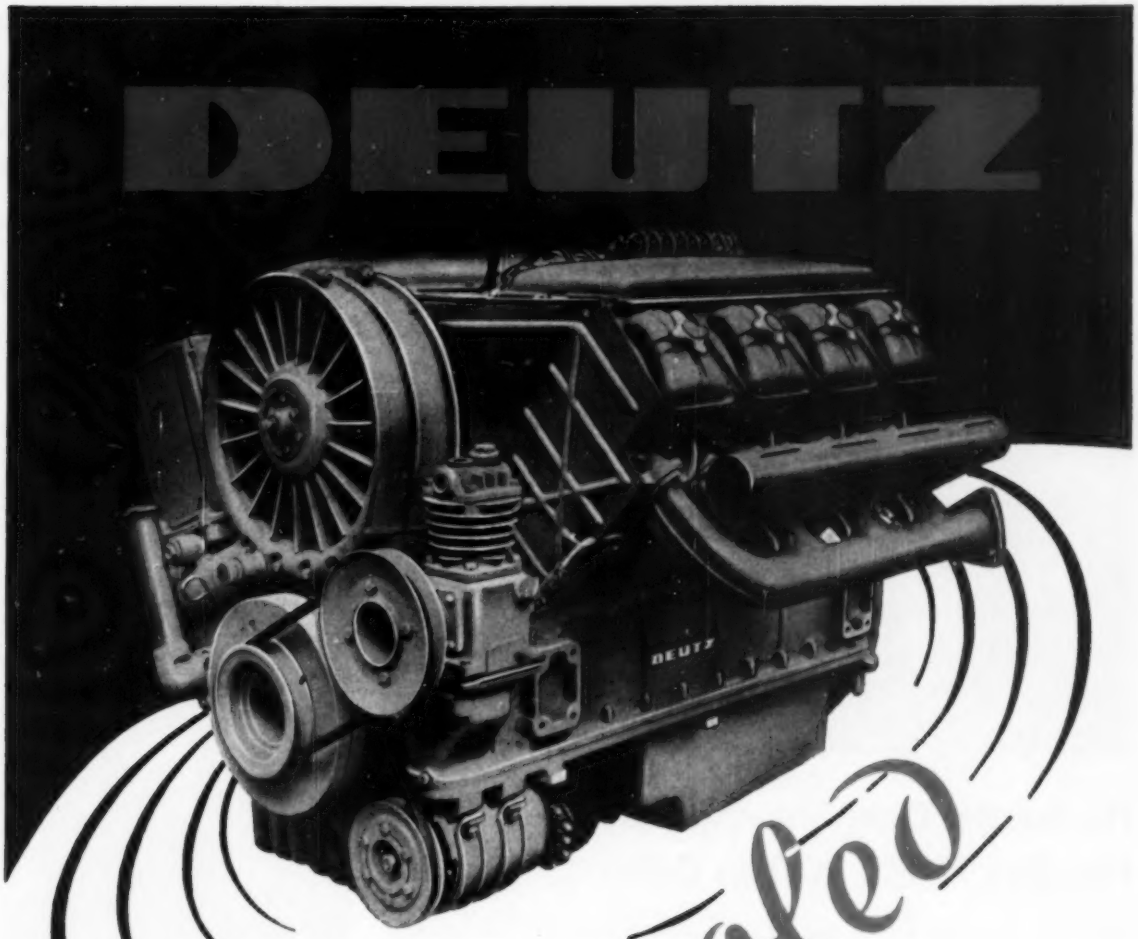

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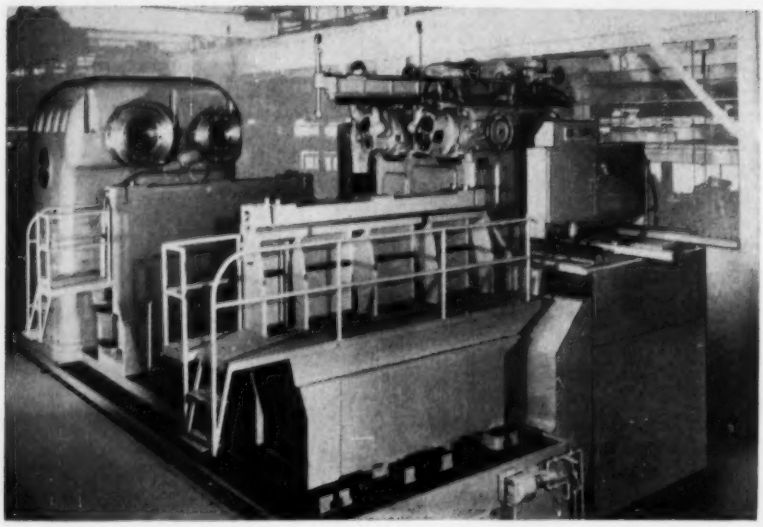


Horizontal Gear-Shaving Machine Handles 15-Ft., 30-Ton Gears

This new gear shaver can handle gears of pitch diameter from 30 to 180 in. Such large gears are needed for reduction gearing in ship propulsion; they require precise tool profile.

The gear-shaving machine is 24 ft. long, 25 ft. wide, and, with work gear, 18½ ft. above its foundation. Accuracy claimed for properly hobbed gears is 0.0003-in. error in pitch or index and a tooth-profile error of 0.0002 in.

The machine shaves gears in their horizontal position while they rotate in journal bearings as they do when assembled. Two pedestals carry the work-gear shaft, which is driven through a flexible coupling by the headstock spindle. Each pedestal has an operator's platform.

The headstock has two spindles 40-in. between centers—one for large and the other for small gears. Simultaneous operation is prevented by change-gear design.

The cutter-head assembly has two slides, each with power traverse. The crossed-axes setting of each cutter head is made by crank to a vernier-dial and dial-indicator setting.

A journal-alignment checking bar, carried between the cutter slides, checks the gear-journal alignment. A vertical arm at the front of the bar has two gaging buttons that actuate a dial indicator. One button checks vertical alignment, the other horizontal alignment.—**National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.**—Am Mach, June 8, p204

Oil-Mist Lubricator

Gallon-size lubricator cuts frequency of filling; an automatic signalling device warns the machine operator when the unit needs refilling. Two models are available. Model 4958 has a switch that blows a horn or lights a red light when the oil level goes below 23 oz. Model 4859 has a closed switch that breaks contact and shuts off the machine at 23 oz.

For use on machines needing less lubrication, two models with 12-oz. reservoirs either signal a warning or shut off the machine at the 2-oz. level.—**Stewart-Warner Corp., 1826 Diversey Parkway, Chicago 14, Ill.**—Paper Ind, May, p254

Glass Insulation For Piping

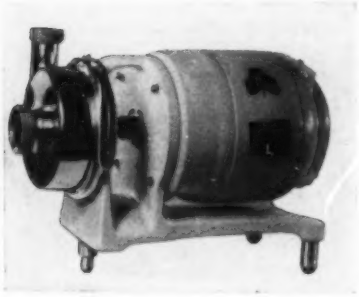
Fiberglass wrap-around pipe insulation marks a long step from conventional rigid insulating materials. The Aerowrap insulation, furnished in rolls 100 ft. long, 36 in. wide, and ¾ or 1½ in. thick, is merely wrapped around the pipe and fastened with staples, adhesive, or Fiberglas cord. It is then covered with a protective jacket of black roofing felt, white asbestos paper-faced felt, corrugated aluminum sheet, or rolled galvanized sheet metal. The resulting job is attractive and dust resistant.

Two precautions should be observed in its use. It is not recommended for pipelines over 600°F. And on cold lines, a sealed vapor-barrier jacket, such as aluminum foil laminated between kraft paper, is required to prevent condensation, frost, or icing on pipes.—**Owens-Corning Fiberglas Corp., Toledo 1, Ohio.**—Chem Eng, June, p250

New Wool-Fancy Exhaust Allows Higher Speeds

Fancy cover for woolen cards is shaped to control air currents and to pipe away any fly resulting from high cylinder and fancy speeds. Cover is adjustable to give a close fit to worker roll. Lint from each card travels through piping to a dampered main duct. Main duct empties into a feeder hopper or a stock bin.

With new waste-exhaust system, 60-in.-dia. woolen-card cylinders can be run as high as 100 rpm. Production increases up to 20% are possible, less cleaning is necessary, and the roving produced is evener than usual.—**Whitin Machine Works, Whitinsville, Mass.**—Textile World, June, p157

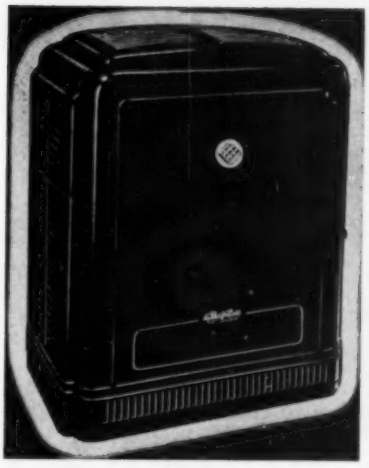


Multi-Use Food Pumps

Efficient transmission and low-cost maintenance are claimed for a line of corrosion-resistant sanitary and industrial non-clogging centrifugal pumps. Pumps have special seals for nearly every requirement and are available in complete range of sizes and capacities up to 1,250 gal. per min.

Screw-type impellers with impeller clips, inert carbon seals easily removed for cleaning, lightweight heads, and Tri-Clamp casing construction are features.

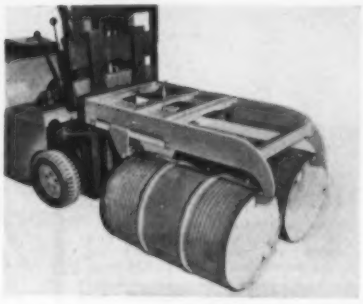
"Pump King" series is designed to operate at 1,800 and 3,600 rpm. The 3,600-rpm. pump is made especially for dairy use. Other models are available for moving diced carrots, cream-style corn, tomatoes, relish, and applesauce.—**Tri-Clover Machine Co., Kenosha, Wis.**—Food Eng, June, p147



Economical Oil Heaters

Line includes two models, H-822 and H-823. Both have 78,000-Btu. output and are equipped with a Midget pilot and multi-heat burner. Extra large heat-director doors at sides swing open to reflect heat where it is wanted. Units have lighter opening at burner level for instant, positive lighting and rapid heat acceleration. Spring-action flexible plunger makes cleaning of oil line a simple operation.

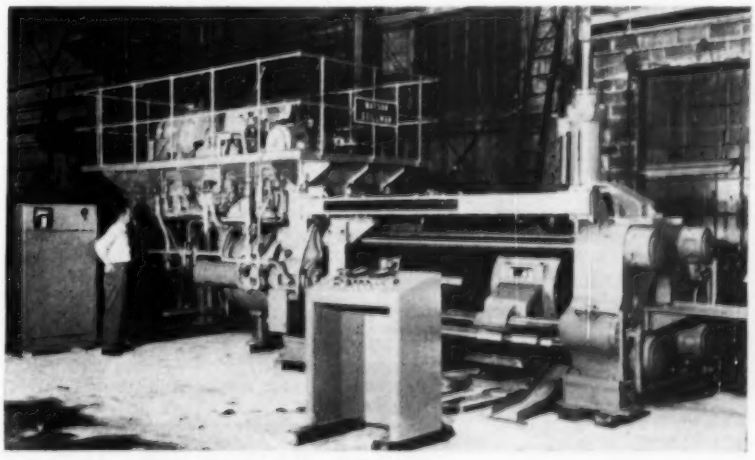
Model H-823 has factory-installed "Floor-Flo" blower. Accessories include automatic thermostat and oil-air control, attached reservoir, and fuel pump when storage tank for stove is set up so it is lower than heater.—**Perfection Stove Co., 7609 Platt Ave., Cleveland 4, Ohio**—Elec Merch, June p138



Device Handles Drums

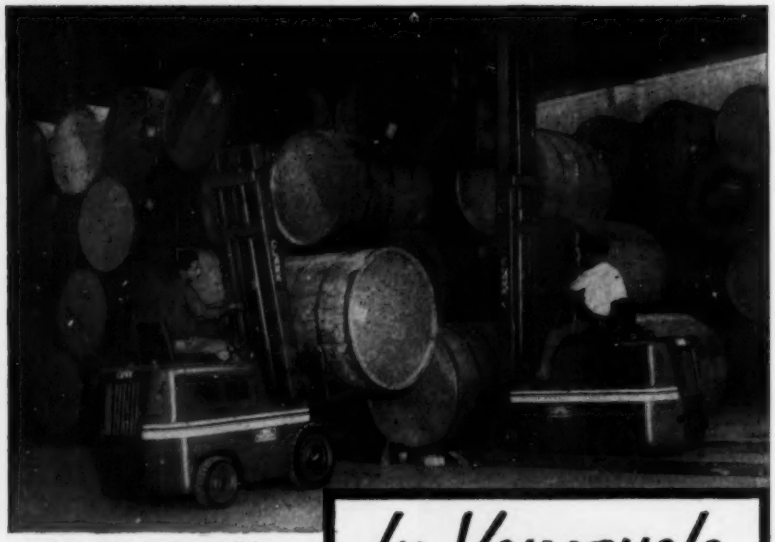
Horizontal handling attachment is semiautomatic, quickly adjustable to a variety of drum sizes for lifting or tiering. It will handle drums from 26 to 38 in. in overall length.

The attachment can carry drums singly or in pairs, empty or full. No tools are required for mounting the attachment.—**Clark Equipment Co., Battle Creek 73, Mich.**—Factory, June, p176



Aluminum-Extrusion Press Has Long Stroke

Modern 1,250-ton aluminum-extrusion press is hydraulically operated, four-column machine. Long-stroke design of main cylinder allows loading billet and dummy block into the container on a single forward stroke of the main ram. Ram traveling at 8 in. per sec. loads a 24-in. billet and dummy block in 4 sec. Press is semiautomatic, with interlocks to protect all mechanisms. —Watson-Stillman Co., Roselle, N. J. —Iron Age, May 28, p102



Mechanized teamwork pays off for C. A. VENEZOLANA de TABACO. Raw materials and finished product are handled economically—the CLARK way.

In Venezuela, CLARK EQUIPMENT Means HIGHER PROFITS!

Handling bulky rolls of paper is simple for PAPELERA INDUSTRIAL, C. A.; they employ a rotating roll clamp device on their CLARK trucks.

CERVECERIA POLAR, C. A. virtually eliminated damage to goods and they enjoy maximum use of storage space by high-tiering case goods.

Profit from the materials handling experience of these three progressive companies in Venezuela — C. A. VENEZOLANA de TABACO; PAPELERA INDUSTRIAL, C. A.; and CERVECERIA POLAR, C. A. These three concrete examples show how CLARK equipment cuts handling costs, regardless of the nature of the product, in the following ways:

- √ **Cuts labor costs, because machine-work replaces muscle-work; one man does many times the amount of work he accomplished manually.**
- √ **Cuts production costs because raw materials are handled faster. more dependably.**
- √ **Cuts distribution costs, moves goods faster onto trucks or trains.**
- √ **Cuts accident rates and damage to goods.**
- √ **Cuts storage and warehousing costs; up to 100% increase in usable storage area when goods are *high-tiered* the CLARK way.**

In every case, low-cost handling has meant higher profits.

CLARK, the world's largest producer of materials handling equipment, has experienced distributors throughout the world. Like MAQUINARIAS MENDOZA, C. A., Caracas (which assists the companies pictured here), they are prepared to help you cut handling costs. For the name of your dealer, write us or simply use the coupon.

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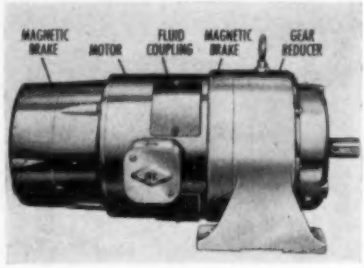
Varying Wire Feed Rate Controls Arc Voltage

Lightweight metal-inert-gas welding machine, model SWM-3, eliminates fluctuating arc voltage by speeding up or slowing down the wire feed rate. An electronic control does the job.

Practically automatic operation is claimed for the machine. The operator presets the voltage and throws the starting switch. A retract starter feeds welding wire into contact with the work, then retracts it to strike the arc. Wire feed maintains preset arc voltage.

The machine can be mounted on a wall, post, or machine carriage. It can make butt, lap fillet and corner welds in aluminum, carbon and stainless steels, deoxidized copper, and aluminum bronze.—**Linde Air Products Co., 30 E. 42nd St., New York 17, N. Y.**—Weld Eng, June, p80



Unit Brakes and Drives

Fluid-shaft Motoreducer consists of a magnetic brake, a motor with internal fluid coupling, a second magnetic brake, and a gear reducer. One use is with a crane travel drive; it eliminates the pendulum motion of the load through smooth starts and stops and can hold it stationary at any point.

Operating sequence is as follows: (1) the motor transmits power to the load through the fluid coupling; (2) after travel, the load is decelerated through the fluid coupling by the magnetic brake on the armature; (3) the load can be then held stationary by the second brake mounted between coupling and gear reducer. The second brake can also be applied when the load is in motion.—**Reuland Electric Co., Alhambra, Calif.**—Prod Eng, June, p252

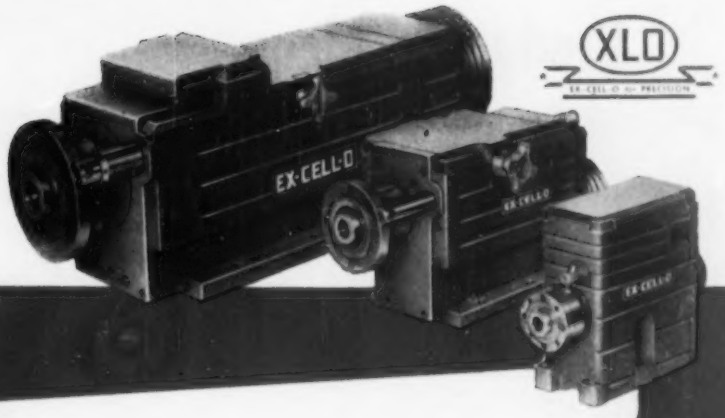
A Minute a Hole

Called Hole-A-Minute, this one-man-operated digger digs holes from 4- to 11-in. dia. up to 6 ft. deep. On model 636S, a shaft extension allows digging beyond the 6-ft. depth. Tool can be used for digging post holes or for installing and repairing wires.

It will work in remote areas with 1- to 2-kw. portable field generators, and its construction makes it practical for drilling at any angle in hard or soft earth or shale. It operates with any air drill with standard Jacobs chuck, or half-inch or larger electric drill rated at 500 rpm. or less, 7 amps. or more.—**Eugene John Freeman & Co., P. O. Box 2143, VanNuys, Calif.**—Elec C&M, June p117

File Refills Itself

New hand tool is a file for deburring and other finishing operations in all types of metalworking shops. It features a cutting surface that feeds from a roll containing 6 ft. of coated abrasive cloth. When cutting surface becomes dull, operator pulls out a fresh cutting surface from the roll.—Monarch Machine Shop, Inc., Madison, Wisc.—Business Wk, June 13, p144



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Ex-Cell-O Power Units feed or rotate tools in easily controlled automatic cycles. A single tool can be held in the unit spindle or a multiple head can be bolted to the quill flange. The Units are used in low-cost, high-production machines for such operations as drilling, reaming, counterboring and spotfacing. A typical machine consists essentially of a plain base, a work-holding fixture and one or more power units.

Ex-Cell-O Units are self-contained and compact; can be mounted horizontally, vertically with the spindle nose down, or at any angle between these positions.

Ex-Cell-O styles 28-A, 21, and 20 Quill-Type Hydraulic Power Units are shown above. They are standard models. Send for *all* the facts about them. Write or cable Ex-Cell-O for Bulletin 45828.

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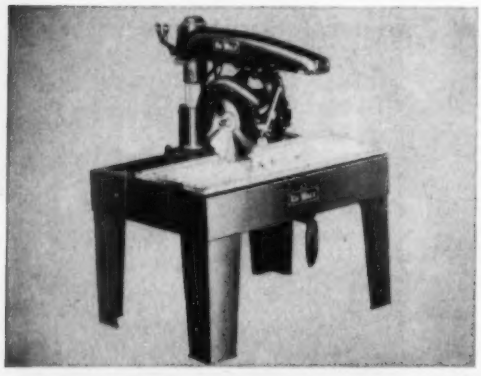
Whatever the job, DeWalt Saws are first in safety, accuracy, economy and rugged dependability.

Other industries, too, are developing better production methods with AMF cost-saving, automatic equipment—from single machines to complete plants.



The AMF DeWalt Power Saw is many machines in one. Every time you change the cutting tool, you have another machine. It cuts wood, metal, plastics... and costs! Available in sizes from ½ to 10 horsepower. Write for free literature and name of your local DeWalt distributor.

AMF does it better . . . automatically!

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481 Fifth Avenue, New York 17, New York, U.S.A.

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AMF products for Home and Industry: AUTOMATIC PINSPOTTERS, BOWLING EQUIPMENT AND SUPPLIES · LOWERATOR® DISPENSERS · WAHLSTROM® FULLY-AUTOMATIC CHUCKS · FLOAT-LOCK SAFETY VISES · ROADMASTER® BICYCLES · JUNIOR® VEHICLES · DE WALT® POWERSAWS · MONARCH® WOODWORKING MACHINES · CLEVE-WELD® TIRE RIMS · SLIP STITCHING AND ORNAMENTAL STITCHING MACHINES · CELLULOSE BANDING MACHINES · LELAND® ELECTRIC MOTORS, GENERATORS, INVERTERS · STERLING RELAYS · EVERLOCK® WASHERS · AMALOY® LEAD-TIN ALLOYS · TOBACCO PROCESSING EQUIPMENT, CIGARETTE AND CIGAR MACHINERY · AMF® CONTINUOUS MIXERS AND GLEN® BATCH MIXERS · UNION MAKE-UP EQUIPMENT AND AMF® BAKERY MACHINERY, COOLERS & OVENS Creators and producers of electronic and mechanical equipment for the armed services.

NEW PRODUCT BRIEFS

Rotary Straightener—Model AX straightener has two 3-hp. motors and drive spindles mounted on unit steel table. Six driven rolls straighten the tube or pipe. Lubrication system directs flood of oil to points where rolls contact work.—**MacKintosh-Hemphill Co., 901 Bingham St., Pittsburgh 3, Pa.**—Iron Age, Apr 30, p81

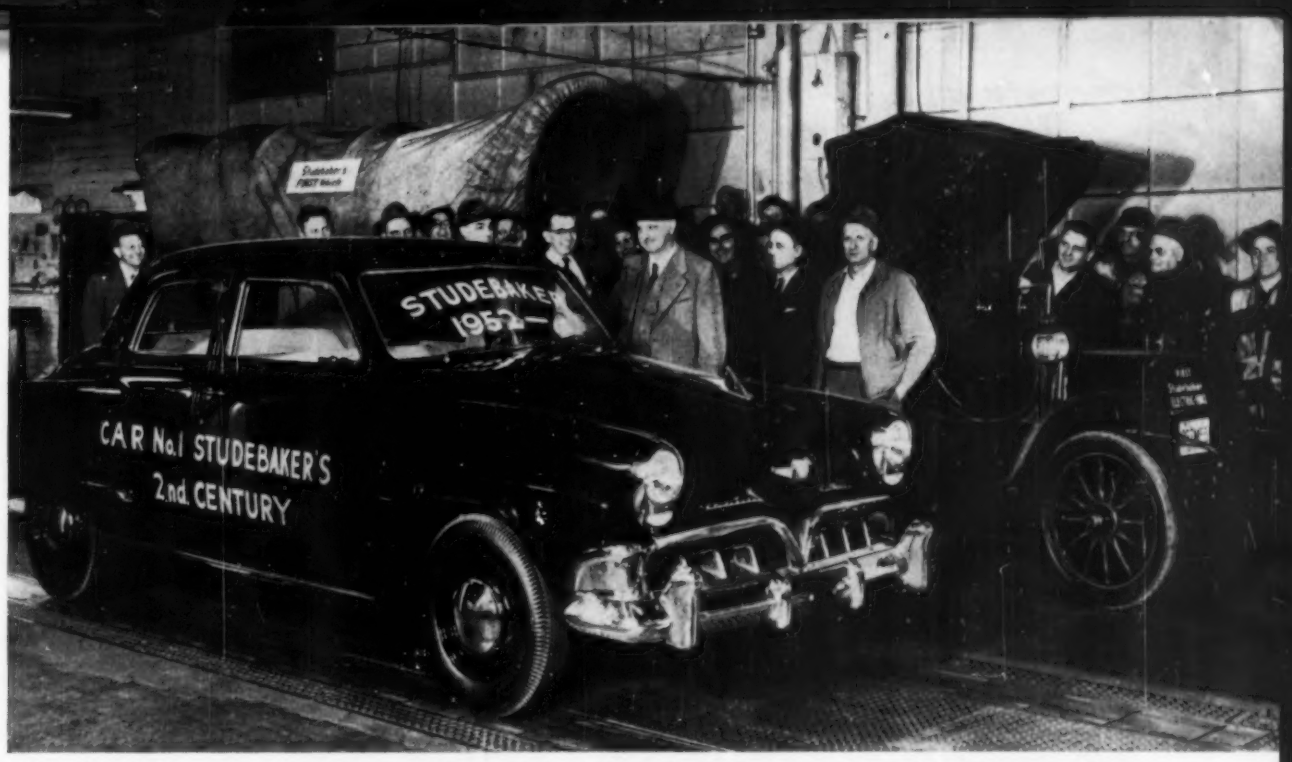
Turbocharged Compressor—Model TRA compressor unit is two-cycle, turbocharged, right-angle, gas-engine-driven unit. Eight vertical inline cylinders of 14-in. bore and 14-in. stroke are connected to horizontal compressor cylinders. Unit develops 1,320 bhp.—**Clark Bros. Co., Olean, N. Y.**—Oil & Gas J, June 15, p169

No Moving Parts—Electronic device measures liquid level in tanks, has no moving parts. It uses cold cathode tubes, is extremely accurate, and is unaffected by pressure or temperature.—**Haledy Electronics Co., 57 William St., New York 5, N. Y.**—Aviation Wk, June 15, p68

Tough Hat—Protective headgear with the shell molded in one piece of lightweight, moisture-proof vinyl has impact, pierce resistance and unusual strength qualities. Design will deflect falling or flying objects.—**Willson Products, Inc., Reading, Pa.**—Const Meth & Equip, June, p194

For Insecticides—N-phenylmaleamic acid is a yellow crystalline material. Possible uses include the preparation of fiber-forming resins and as an intermediate in the synthesis of insecticides.—**American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y.**—Chem Wk, June 6, p46

Centerhole Saws—Maker furnishes circular saws 6, 7, 8, and 9 in. in dia. and bushed ⅝ in. to ½ in. Saw types include rip, cut-off, combination, easy-cut, and planer. Instructions with each saw tell how to remove bushing when a ⅝-in. centerhole is desired.—**Simonds Saw and Steel Co., Fitchburg, Mass.**—Ind Dist, June, p132



THIS CHAMPION is the first off the assembly line in Studebaker Corp.'s second century of making highway vehicles

Wheels For World Progress

If it will advance, the world must have wheels. For a hundred years, the Studebaker organization has met that need in the tradition "of giving more than you promise."—An original Digest article

IN 1852, the U. S. was a nation of people on the move. New frontiers to conquer, a better way of living, and a simple desire to travel beckoned people to take to the roads that were beginning to criss-cross America. And it was wagons that carried the people.

On February 16, 1852, two young men went into business for themselves in South Bend, Indiana. They would shoe horses and repair and build wagons. The sign over their shop read H & C Studebaker.

Business was slow at first, but now and then they would get orders for wagons. With each wagon built and sold, the brothers' reputation grew. Soon their wagons were known all over the world. Success had come to the Studebakers.

Then came the horseless carriage. But only John M., of the famous Studebaker brothers, was left alive. He saw the horseless carriage not as a threat to his wagon business but as a means to improve it.

First the company made electrics, as battery-powered automobiles were called. In 1909 Studebaker bought a gasoline-engine automobile company. For the first time, Studebaker controlled and owned a motor car in its own right. Business boomed. But in 1917 old John M. died and the company, now the Studebaker Corp., was managed by a group of bright young men, later to include Harold S. Vance and Paul Hoffman.

In 1919 the company got rid of the carriage and wagon business. Automobiles were the future. By 1928 the Studebaker automobile line was complete.

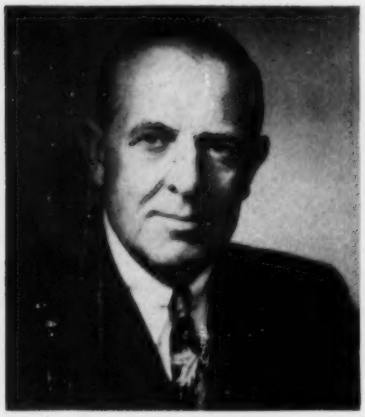
Then the world was plunged into the great depression. Times were too bad to sell cars. The company reorganized in receivership with Harold S. Vance and Paul G. Hoffman as key men. Studebaker pulled through the depression—the only auto company to survive receivership successfully.

In 1939, Studebaker brought out the lightweight Champion. It was a successful car—sales figures climbed. Studebaker management felt it knew the transportation problems and needs of the world. The Champion confirmed management's theories, and now there was no doubt that Studebaker had made a comeback.

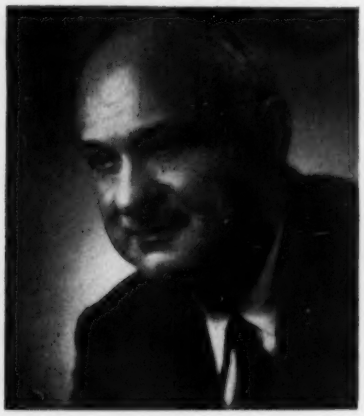
War also came in 1939. Studebaker converted to war materials—trucks, aircraft engines. Like its covered wagons, Studebaker trucks went to the far corners of the world.

At war's end, the company faced the problem of

These Are the Men That Manage Studebaker



PAUL HOFFMAN, chairman, is former Economic Cooperation chief



HAROLD S. VANCE, president, looks for "boundless opportunity" in future

R. A. HUTCHINSON, vice-president, knows overseas business thoroughly

getting back to making automobiles. It got back quickly by startling the auto world with a completely new body styling. Studebaker had gotten ahead of the field.

Now in 1953, Studebaker has come up with a newly-styled car that reflects the U. S. public's desire for an automobile with European styling. Once again Studebaker has proved itself the leader of independent auto makers.

Overseas, Studebaker believes that the automotive industry makes the same contribution to the growth of the economy of other countries as did the automotive industry in the U. S. R. A. Hutchinson, head of Studebaker's export division, says, "This growth will be most significant in countries where the people of that country are actively engaged in the entire operation—from financing, to production, to sales."

With Studebaker, these operations are wholly owned by nationals, entirely staffed by nationals, and the entire wholesale and retail organization, including financing, is carried out by nationals. This system has proved highly successful because:

- **Skilled Studebaker specialists,** by offering their know-how, have trained and guided their national counterparts. The result is a minimum of the trial-and-error that usually accompanies any new venture.
- **At the same time,** this partnership of teaching and learning brings out high-quality performance of all people concerned.
- **The system fosters** a spirit of national pride that finds its way into business, government, and finance.

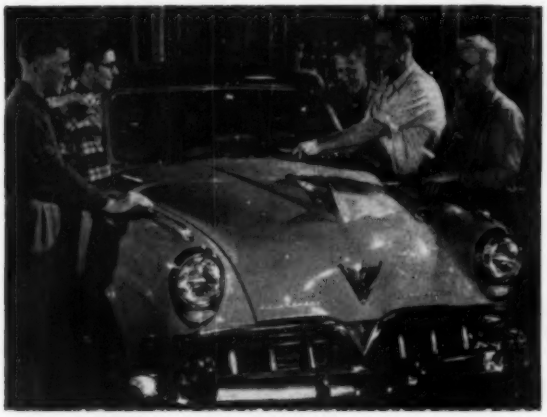
Studebaker's approach to the overseas market has been to enrich the economy of the countries where it operates, to bring social services and opportunities for employment to hundreds of people in those countries, and to raise their general standard of living. This has been done by establishing distributor-owned assembly and manufacturing plants and sales outlets. Studebaker has 11 assembly plants with facilities for the assembly of automobiles and trucks in various stages of manufacture.

The largest assembly and manufacturing plant is located in Calcutta. Owned and operated by Hindustan Motors, Ltd., the Calcutta factory has a total land area of over 530 acres. Other plants with volume capacities are in operation in Uitenhage, South Africa; Brussels, Belgium; Sao Paulo, Brazil; and Mexico. There are additional distributor-owned Studebaker plants at Copenhagen, Buenos Aires, Manila, Alexandria, Malmo, and Cork. Special assembly arrangements exist in Australia, New Zealand, and Colombia.

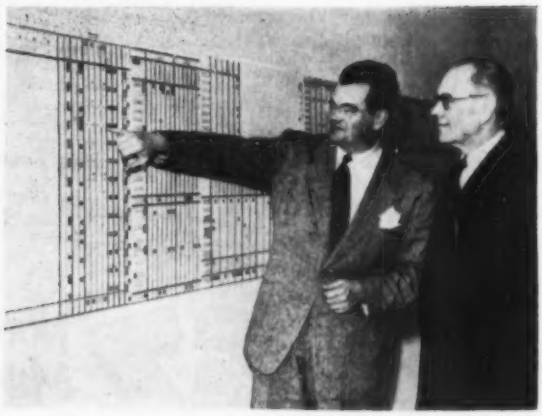
When the boxed shipments reach overseas plants, they are assembled into cars and trucks by the plant's own experts, many of whom learned Studebaker's production and engineering methods at South Bend. Company engineers and production specialists assist and guide their counterparts at the overseas

IN SOUTH AFRICA, an engine is mounted on a chassis during final-assembly operations

Father-and-Son Teams Are a Tradition at Studebaker



IN THE U. S., father-and-son teams put finishing touches on a new automobile



IN BELGIUM, father-and-son team plan operation of their distributor-assembler organization

plants with their operations and see to it that they follow Studebaker's rigid standards.

In addition, the company's expert production-engineering department supplies these plants with all the necessary blueprints, instruction material, and other production data. It supplies too a considerable amount of technical advice on all aspects of production engineering.

More than 1,500 overseas establishments display the Studebaker sign of sales and service. Besides their own retail operation, most foreign distributors maintain sub-dealer organizations and up-to-date service facilities. If the distributor's franchise covers an entire country, his sales organization may number as many as 150 sub-dealers or more.

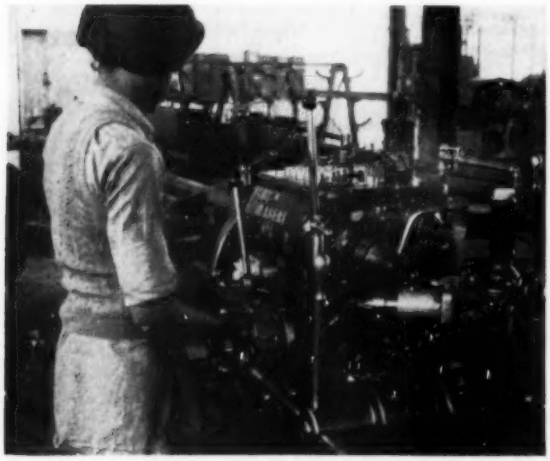
A typical Studebaker overseas distributor who has built up a successful organization is the D'Ieteren firm of Brussels, Belgium. In the 20 odd years that the D'Ieteren organization has represented Studebaker, it has grown from a retail distribution outlet for Brussels into a multi-million dollar distributor-assembler of Studebaker products.

Representing Studebaker for all of Belgium and the Grand Duchy of Luxembourg, the D'Ieteren firm wholesales Studebaker products to a network of Studebaker sub-dealers blanketing this area. Besides its wholesale and retail operations, and its assembly-manufacturing operations, the D'Ieteren firm also exports Studebaker products to countries where the direct export from the U. S. is restricted, either because of dollar shortages or where a more favorable trade arrangement exists between Belgium and the country concerned.

A sizeable percentage of parts, components, and supplies that go into the assembly of overseas cars is manufactured in the country where the assembly plant is located. The percentage of locally manufactured parts is increasing, notably in the South American and Belgian operations. Also Studebaker representatives are working with national manufacturers to assist them in developing new parts.

A distinguishing feature of Studebaker's relations with overseas establishments is that they are offered assistance rather than surveillance. Studebaker's export-division management devotes a major part of its time to visiting among owners and operators of overseas establishments. Management thus learns the overseas problems first hand and can quickly work out solutions with the help of South Bend.

For the future, R. A. Hutchinson has this to say, "If I should be required to make a long-range prediction, which I realize is not a wise thing to do, I would say that Studebaker's export business methods will continue to grow. Here in America we preach the doctrine of individual enterprise. Studebaker has put that doctrine into actual practice in its relations with overseas companies. This may sound far-fetched coming from an average business man, but it seems possible to me that such a relationship could be the foundation for world peace."



IN INDIA, worker machines parts that will go into Studebaker automobiles and trucks

ERIEZ, pioneer developer of permanent magnetic separators, leads the field in both design of products and experience in solving magnetic separation problems. By making available highly-efficient non-electric magnetic separators that are easily applied to almost any materials-handling system, ERIEZ has been responsible for the rapid acceptance of these devices throughout industry. The magnetic strength of an ERIEZ Magnet lasts indefinitely . . . it loses less than 1% magnetic strength in a century. If you have a ferrous metal separation problem, you can rely on ERIEZ for:

A. The most efficient and dependable magnets available.

B. The help of engineers best qualified to recommend installations.

ERIEZ Non-Electric Magnetic Separators

- **Reduce machinery damage**
- **Prevent fires and explosions**
- **Eliminate product contamination**

. . . IN DOZENS OF INDUSTRIES

TEXTILE – ERIEZ Magnetic Separators prevent damage caused by the entry of iron contamination into openers, lickerin rolls, beaters, garnett roll teeth and other expensive machinery . . . for example, when iron pieces go through the card rolls in a woolen mill, the clothing must be replaced. A powerful ERIEZ non-electric magnetic separator, usually installed over the spiked apron leading to the card, eliminates such losses. The saving by avoiding this hazard just once usually pays for the ERIEZ equipment.

CHEMICAL – ERIEZ plate, pulley and drum separators are used in scores of ways to remove contaminating iron from lines in chemical processing. ERIEZ Permanent Magnetic Drums are specially designed for effective iron contamination removal and automatic self-cleaning when materials are not conveyed on belts. Iron is pulled to the shell of the drum and held while clean material falls free. Ordinarily installed at discharge end of gravity flow chutes, screw conveyors, and spouts.

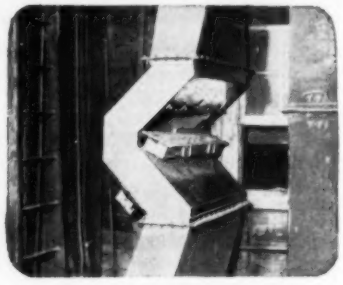
MINING – In more and more coal mines, conveyor belts hoisting coal from mine to tipple are passed over permanent magnetic pulleys developed by ERIEZ. *With absolute dependability*, the strong non-electric Alnico magnets remove all pieces of iron. To quote one large American mine operator: "Since changing to an ERIEZ non-electric permanent magnetic pulley, we have received better magnetic protection than ever before—as well as reduced operating, repair and maintenance costs."

FOOD – ERIEZ magnets recently solved a difficult contamination problem for a large chocolate manufacturer. Cocoa beans from the warehouses are first cleaned by air, then passed over ERIEZ non-electric plate magnets to remove rust scale and iron particles. At cracker and fanners, another plate magnet further cleans the material. Then the shelled beans pass through a gravity chute to an ERIEZ magnetic drum separator. Result: Contamination problem solved!

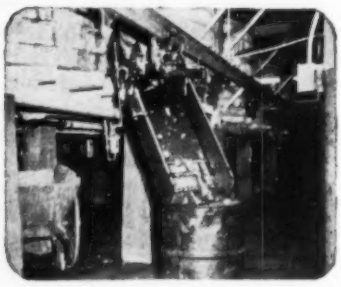
ERIEZ INTERNATIONAL

HOW THEY ARE USED:

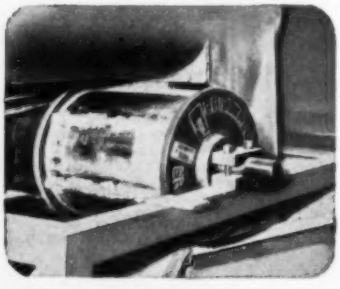
One of eight ERIEZ magnetic pulleys in rubber reclaiming lines, the B. F. Goodrich Company, U.S.A.



Gravity flow ERIEZ hump separator following a bucket elevator, Beacon Milling Company, U.S.A.



ERIEZ giant plate magnet in gelatin processing lines, Wilson Packing Company, U.S.A.



ERIEZ drum at discharge end of screw conveyor, Kellogg Company, U.S.A.

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MANAGEMENT REPORT

Take a tip from Rockwell Mfg. Co. and use an air taxi if you have several plants within a few hundred miles radius, as Rockwell does with its headquarters in Pittsburgh and seven plants within 200 miles. The company found that, for effective management, personnel travel between plants was too slow by car, train, or regular airline.

So Rockwell bought a seven-passenger S-55 Sikorsky helicopter to shuttle executives where they are needed. Daily "schedules" are determined on the basis of advance travel requests.—Chem Eng, June, p 297.

How to weld, braze and solder aluminum is the subject of a new 186-page manual. Thirty-four different processes are covered in the manual. Included is a description of the new "cold" welding techniques.

Write on your letterhead to Reynolds Metals Co., International Div., 19 E. 47th Street, New York 17, N. Y. for your free copy.

Industrialists and businessmen interested in developing foreign trade can obtain a special series of reports on the European market from Scandinavian Airlines System. SAS has compiled vital statistics about Norway, Denmark, Sweden, and Germany entitled "World Trade Bureau Report".

The report on Norway, for example, covers: country and people (area and population), currency, investments, taxes, industries, foreign trade, and, generally, everything the businessman should know about trading with Norway. It also includes tariff policy and structure, import, export, and exchange controls.—Aviation Wk, June 8, p 26

Photographs and models now accomplish more in the training of Boeing Airplane Co. draftsmen and engineers than formerly was possible in tours of the factory. Under the new plan, models have been made of a drop hammer, press brake, hydropress, and stretchwrap, while 350 colored photographs show manufacturing processes.

Now the trainees never leave the classroom. The models are demonstrated to them, just like the originals in the factory, while the colored slides illustrate the lectures. The result is an improved teaching technique that saves both time and money. —Factory, June, p 124

Scientists have been working with higher mathematics to answer a lot of problems that have been bothering business management. Some of the new methods include scientific sampling, correlations, ranking, the information theory developed from work at Bell Telephone Laboratories, decision theory, and linear programming.

Some day the new methods may give management hard arithmetical values to things that have always been considered intangible. Right now, little more than experimenting has been done.—Business Wk, May 30, p 96

A new method of training fork-lift truck operators in all their trades—operation, maintenance, and safety—has been developed by the Yale & Towne Mfg. Co. The course consists of lessons grouped together or presented in parts.

Section One describes truck operation. Section Two provides information on preventive maintenance and gives practical check lists. Section Three describes the safety problem.

Directions for setting up meetings and conducting training classes are included. Practice operating courses, indicated in suggested layouts, are easily set up in any plant or warehouse.

If you have no suggestion plan, consider these results from 14 typical aircraft plants. The 16,812 suggestions made in 1951 netted the suggestion makers $470,480 and cut production costs $4½-million. One out of every four suggestions resulted in a production economy.—Am Mach, June 8, p 193

Tri-level building is something new in office and industrial construction, but it is getting to be routine in residential units. Dresher Mfg. Co., maker of upholstered headboards, now occupies a new tri-level building in Chicago. Cost was $5.15 a sq. ft.

The low cost was made possible partially through the tri-level device. The factory portion is on the middle level, utilities and locker rooms are half a flight down, and offices are on the upper level above the utilities.—Am Business, May, p 3

Lubrication scheme for small plants gets the right lubricant on the right machines at the right time. Attach to each machine 4x6 in. schedule cards of different colors—red for daily lubrication, blue for weekly, yellow for quarterly, and white for semiannual. Keep them in plastic pockets to keep them clean.

Service data printed on the upper half of the card tell the oiler what to do. When he finishes, he ticket-punches the card. A machine repairman should be made responsible for the semiannual service. The system needs little supervision—only random checks by foreman and repairman.—Mach, May 23, p 833

PRODUCTION IDEAS

from Manufacturers' Catalogs

Printing Press Drives—Bulletin GEA-5702 covers design features and application of a.-c. preset-speed press drive with ratings up to 15 hp.—International General Electric Co., 570 Lexington Ave., New York 22, N. Y.

Saw Blades—Catalog 20 gives specifications of many types of saws, such as rip, combination, cross-cut and flat ground mitre saws.—F. Heinemann Saw & Mfg. Co., Canton 6, Ohio.

Sheet-metal Test—The Flex-Tester and Spherometer, instruments to make non-destructive tests of sheet metal for drawing qualities and stretcher strain, are described in form B-1.—Steel City Testing Machines, Inc., 8817 Lyndon Ave., Detroit 21, Mich.

Gear-shaving Machine—Bulletin describes the world's largest shaving machine that will handle gears up to 180-in. P. D.—National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich.

Electrical Equipment—Booklet describes electrical equipment for chemical processing. It has sections on power generation, distribution, and utilization. — Westinghouse Electric International Co., 40 Wall St., New York 5, N. Y.

Microhoning—Vol. 4, No. 6 and Vol. 5, No. 1 of Cross-Hatch describe Microhoning equipment and its use in industry.—Micromatic Hone Corp., 8100 Schoolcraft, Detroit 4, Mich.

Electric Generating Plants—Bulletin covers line of electric, diesel-electric, marine electric generating plants and their accessories.—D. W. Onan & Sons, Inc., Royalston Ave., Minneapolis 5, Minn.

Temperature Recorders—Bulletin 447 describes temperature recorders, thermal systems, and temperature accessories.—Foxboro Co., Foxboro, Mass.

Turret Lathes—Construction and features of Series 900 and 1000 precision turrent lathes and No. 2-H turret lathes are given in catalogs 5225 and No. 67-F.—South Bend Lathe Works, 425 E. Madison St., South Bend, Ind.

Industrial Floors—Bulletin 3-1 describes industrial floors that are acid, alkali, solvent, and grease-proof.—Atlas Mineral Products Co., Mertztown, Pa.

Drills—Illustrations and features of 16-in., 5,000- and 10,000-rpm., sliding-head box-column, single- and multiple-spindle floor and bench drills are found in catalog D-111.—Cincinnati Lathe & Tool Co., Disney St., Cincinnati 9, Ohio.

Conveyors—Bulletin illustrates engineered conveyor systems and standardized units consisting of gravity conveyors, power-driven conveyors, and pneumatic tubes.—Standard Conveyor Co., North St. Paul 9, Minn.

Pulp and Paper Industry—Principal features and many applications of process control instruments in pulp and paper mills are discussed in bulletin A-130-1.—Fischer & Porter Co., Hatboro, Pa.

Metal Hose and Tubing—Catalog CC-400 describes seamless and strip wound flexible metal hose and tubing. Available alloys and sizes are listed as well as engineering data.—American Brass Co., Waterbury 88, Conn.

Hose Couplings—Le-Hi hose couplings, hose clamps, valves, and manifolds are covered in Condensed Catalog No. 1.—Hose Accessories Co., 1715 W. Lehigh Ave., Philadelphia 32, Pa.

Pneumatic Tools—Bulletins describe pneumatic grinders, automatic air line filters and lubricators, air-pressure regulating valves, roll pickers, and bobbin choke removers.—M-B Products, 46 Victor Ave., Detroit 3, Mich.

Spray Nozzles—Complete technical details on atomizing nozzles, spray nozzles, and spray-nozzle clusters are given in bulletin 6-A.—Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.

Color Dynamics—Scientific use of color in industry is explained in form Adv 225 revised BP. Form Adv. 225 Rev.—DO deals with color dynamics in schools and colleges.—Pittsburgh Plate Glass Co., Grant Building, Pittsburgh 19, Pa.

Plastic Pipe—Pertinent information on flexible, semi-rigid, rigid high-impact, and rigid polyvinyl chloride pipe is given in brochure.—Triangle Conduit and Cable Co., Inc., Plastic Products Div., New Brunswick, N. J.

Selenium Rectifiers—Bulletin RDP-112 gives complete information on selenium rectifiers and their use.—Fansteel Metallurgical Corp., 2200 Sheridan Road, North Chicago, Ill.

Woodcutting Machines—Foldout Illustrates and gives data on many DeWalt woodcutting machines. — American Machine & Foundry Co., Int'l Div., 485 Fifth Ave., New York, N. Y.

Calculators—Bulletins SPG-1 and EFA-4 describes Figuremaster calculators and form DRX-1 details Figurematic calculators. — Marchant Calculating Machine Co., 1745 Powell, Oakland 8, Calif.

Convection Furnaces — Multi-range box-type, convection furnaces for temperatures 400° to 1850° F. are covered in bulletin HD 341. Bulletin IND 451 describes pit-type convection furnaces.—Hevi Duty Electric Co., 4212 W. Highland, Milwaukee, Wis.

Lubrication—Lubriplate Data Book 7-52 gives data on various types of Lubriplate for use in many industries.—Fiske Brothers Refining Co., 129 Lockwood St., Newark 5, N. J.

Geon—"Packaging Problems Solved With Geon" gives eight case histories of packaging problems solved by use of Geon.—B. F. Goodrich Chemical Co., Rose Bldg., Cleveland, Ohio.

Swing Joints—Specifications of swing joints for oils, gasoline, water, air, gas, and many chemicals are given in catalog 400.—Barco Mfg. Co., 1801 Winnemac Ave., Chicago 40, Ill.

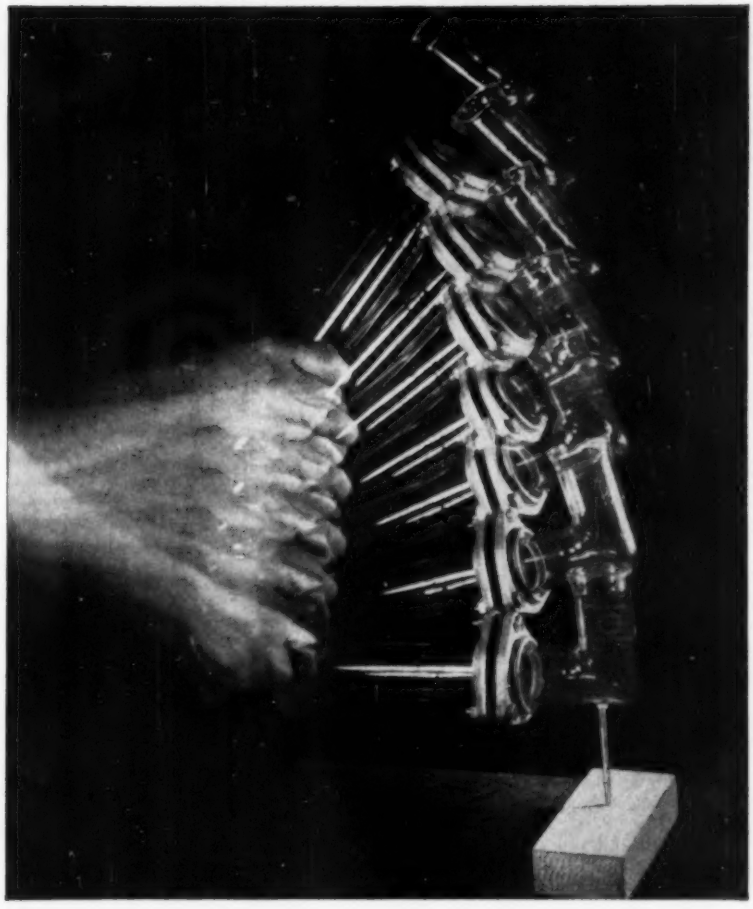
Heavy-duty Engine—A small, light, heavy-duty engine, TS diesel, is described in form 10027. Included are specifications, weights, performance curves, and dimension tables.—Ingersoll-Rand Co., Phillipsburg, N. J.

Locks—Catalog 59 gives data on Eagle door locks with pin tumbler mechanism. Eagle padlocks are covered in catalog 58.—Bowser Inc., 420 Lexington Ave., New York, N. Y.

Air and Hydraulic Equipment—General catalog includes information on chucks, air cylinders, hydraulic valves, hydraulic presses, pumps, etc.—Logansport Machine Co., Logansport, Indiana

Please write directly . . .

. . . to the manufacturers for the free literature announced on this page. Tell them definitely which catalog you want—specify the catalog number or its name when either one is given. And mention that you saw the offer in the McGraw-Hill Digest.



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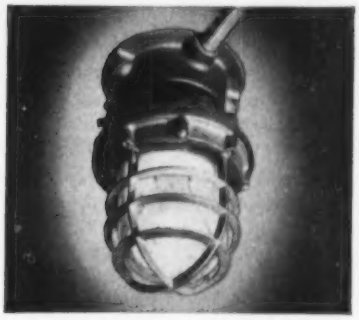

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Editor & Publisher, Business Week

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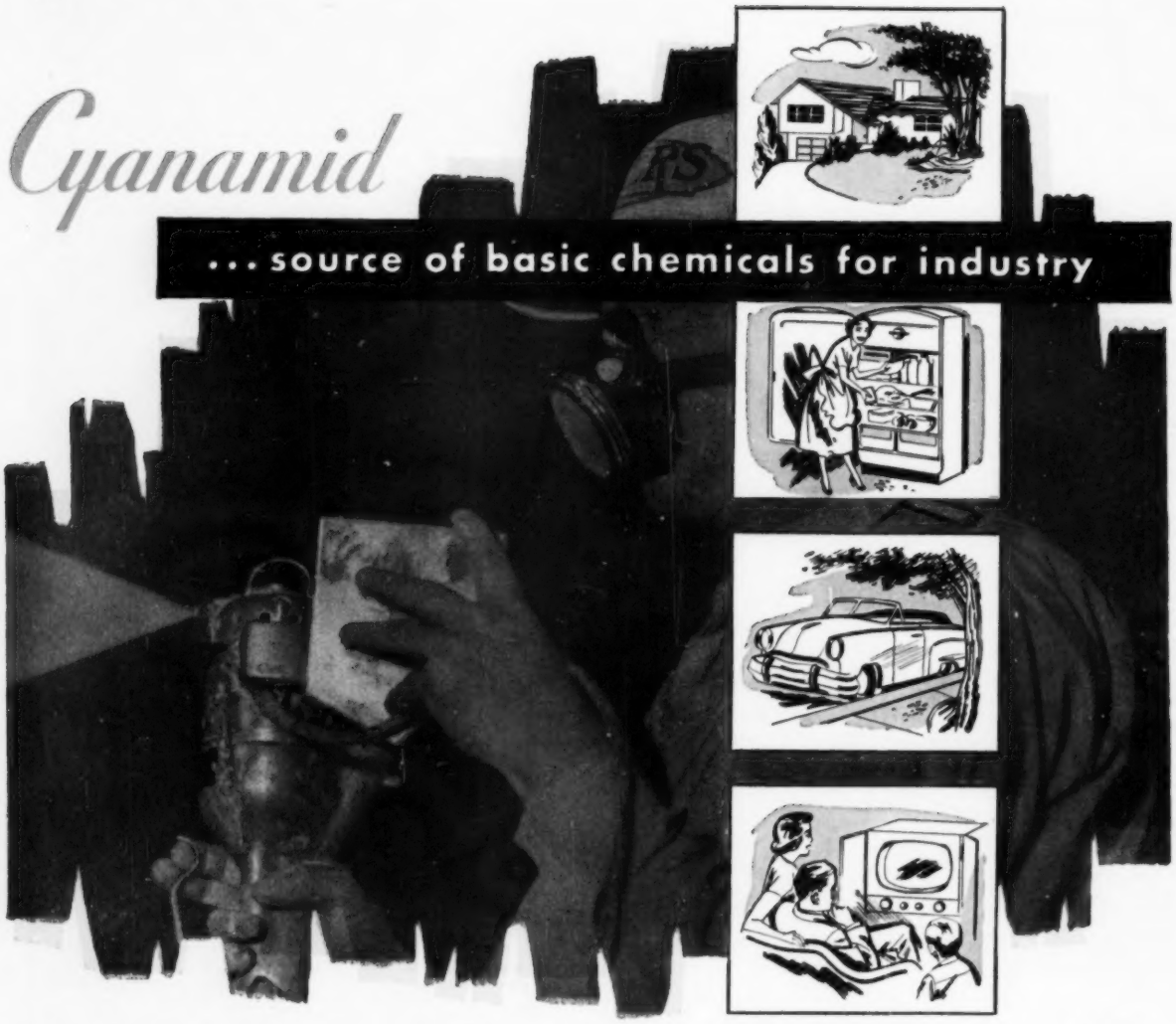

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